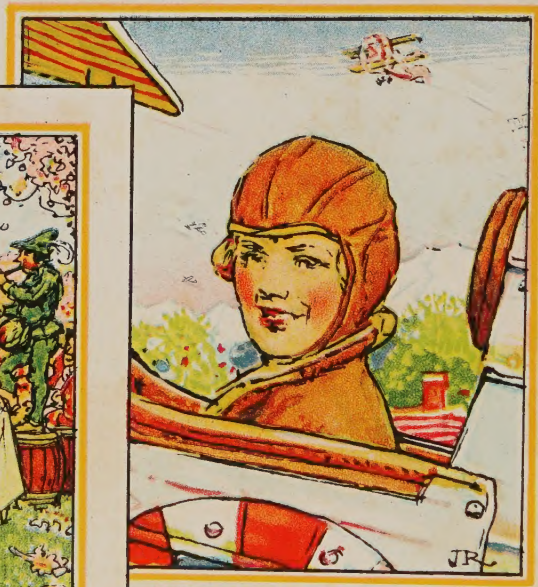
MORE REALLY-SO STORIES

ELIZABETH GORDON
and JANE PRIEST



MISS AMELIA EARHART

"KEARSAGE" and the "ALABAMA

JR

Rainbow Edition
CHRISTOPHER
IEVVPST BABY DIRICIBLE NEVA
SPINNING IN THE SUN

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MORE REALLY-SO STORIES

HE WAS A MUSICIAN AND A SHEPHERD . . .

MORE REALLY-SO STORIES

by

ELIZABETH GORDON
and JANE PRIEST

PICTURES
by
JOHN RAE

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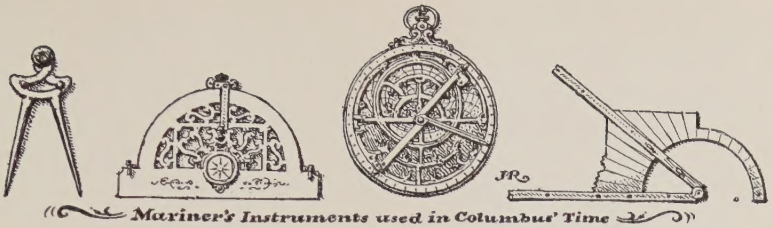

Mariner's Instruments used in Columbus' Time

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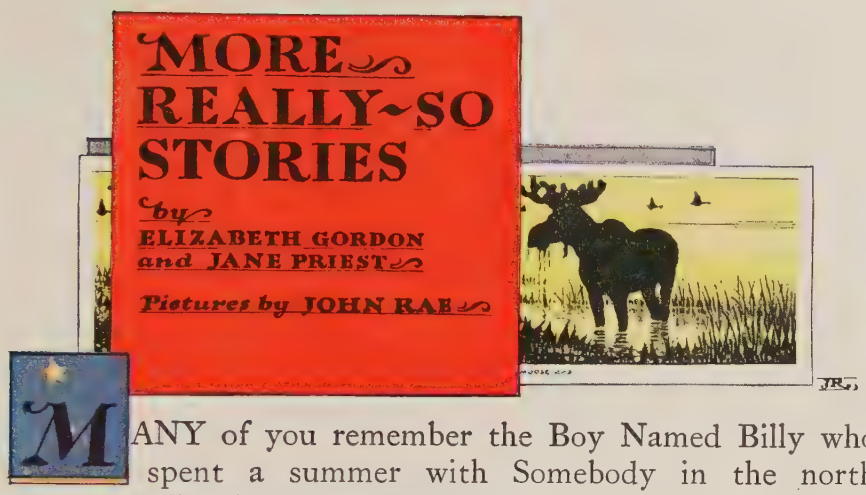


MANY of you remember the Boy Named Billy who spent a summer with Somebody in the north woods. Billy did not care for make-believe stories so much as he did for true ones. He was *tremendously* interested in the things that are *really-so:* how customs began, and what certain days mean, and *why* things are the *way* they are. So Somebody told him about them, and they were put into a book called *The Really-So Stories* that many of you have read.

But the Boy Named Billy was like Oliver Twist: he wanted more. He was always wishing for more really-so stories. And Mom and Dad *couldn't* answer all his questions—they had a few other things to do. So they thought of the plan of asking Somebody to come and make them a good long visit while writing a new book, and just answer Billy's questions when it was *perfectly convenient.* It so happened that Somebody, who strange to say enjoyed answering questions anyway, was delighted with the idea. And so there were more really-so stories.

And because so many children, both small and large, liked *The Really-So Stories* just as much as Billy did when they were all put into a book, here is a book of *More Really-So Stories,* which Somebody told on that long visit to Mom and Dad, Big Sister, Little Sister, Uncle Ned and old dog Towse—not forgetting the Boy Named Billy.

AGES UPON AGES AGO . . .

SOMETHING ABOUT AMBER

"COUSIN ELSA just dropped one of her biggest amber beads on the hearth and it rolled into the fire and burned up—fizz—just like that," said the boy named Billy. "It smelled like pitch and burned like it, so it couldn't have been real amber after all; it must have been made of celluloid."

"Those beautiful amber beads of Great-great-grandmother Kyle's were certainly not made of celluloid." said Somebody.

"That's so," said the boy named Billy; "there couldn't have been any celluloid then. But amber is a stone, isn't it? And stone wouldn't burn like that. My teacher told me that amber comes from the bottom of the sea. How, then, could it burn just like a pine torch?"

"Because, that is exactly what it is," said Somebody. "Your teacher is right as far as she has told you, but there is a lot more to it."

"Do tell us the rest of it!" said the boy named Billy.

"Ages upon ages ago," said Somebody, "there grew in the Baltic regions wonderful forests of immense pine trees which are the only true resin bearers. In those early ages the world had not yet settled down to business, as it has now. And so one day along came the sea and covered up those forests, twisting and breaking the trees to pieces and liberating the resin which oozed out in great drops and went to the bottom of the sea. The wood was turned into stones and the resin was, by the action of the waves and the chemicals in the water, turned into a pale golden substance which after long years rose to the surface of the water. When it was first discovered, it was thought to be ambergris and the name amber is taken from that word."

"What's ambergris?" asked the boy named Billy.

"That, as Kipling says, is another story."

Billy laughed. "Let's finish this one," said he.

DIVERS . . . GO TO THE BOTTOM OF THE SEA

"Much of the amber of commerce," said Somebody, "is cast up at ebb tide along the Baltic and North Sea coasts and the promontory of Samland. The natives wade into the water with long-handled drag-nets with which they pull in the bunches of seaweed in which are entangled the pieces of amber.

"Divers are also employed to go to the bottom of the sea to bring up fine pieces which have not come to the top. There are also amber mines where the beautiful substance is taken from the ground. This is called 'pit amber' and if you were to find a piece, you would very likely never know it for itself because it is covered by a crust which is called the matrix. This is removed by the miners by putting the pieces in a revolving barrel containing sand and water.

"It was found that when amber was polished it attracted straw and other substances. The Greeks called amber 'elektron,' and our word 'electricity' came from this."

"What other articles are made of amber besides beads and jewelry?" asked the boy named Billy.

"Amber is used to make many small articles, like the mouthpieces of pipes and cigar holders, buttons and the stems of vases; and the imperfect masses of amber are dissolved in alcohol and used to make varnish for pieces of fine furniture and violins. In the pieces of amber which are found," went on Somebody, "are often perfectly preserved bugs and spiders, also perfect impressions of ferns and flowers."

"It sounds like a fairy tale," said the boy named Billy. "One can almost imagine the sea gnomes working down under the waves, century after century, to turn the trees into stone and to make the beautiful clear amber to send back to the earth in payment for having taken away forests. Why, even the varnish on grandmother's old mahogany table may have been under the sea for ages and ages. I'll be pretty careful not to scratch it after this, I'll tell you. *Really-so* stories are most interesting, aren't they?"

"I think so," said Somebody, smiling. "And I am very glad that you like them, too."

Chinook Salmon, Columbia River

ABOUT SALMON

"MY, I'M hungry," said the boy named Billy at dinner, "and this is the *best* fish. What is it, Mother?"

"It is Columbia River Salmon, and a very fine one too—I'm glad you like it, Billy Boy!"

"It certainly tastes like more," said Billy, passing his plate for a second helping. "I'd like to go fishing in the Columbia River if this is the kind of fish it has. It must be a wonderful river."

"It is a wonderful river, in the wonderful state of Oregon," said Somebody, "and the life of the Salmon is a very interesting study. It reads like a book from the time it is hatched until we have it on our dinner table."

"A really-so story!" said the boy named Billy. "Tell us about it please, Somebody. Where does he get his name?"

" 'Salmo,' meaning 'leaper,' " said Somebody, "and he has to be a good leaper to get up the Columbia, it is so full of falls and swift currents.

"Perhaps it will be best to start at the beginning. The egg that the fish hatches from has been deposited in a hole dug in the gravel by his daddy fish, at the bottom of the river, away up at its source. The mother puts her eggs in the gravel where there is a current of water flowing over them. Then Mother and Daddy Salmon go away and do not come back.

"The Salmon babies are called parr, and they remain in

their shallow home waters for two years when they change their name, being now called smolt. Tiring of the fresh, shallow water they set out upon their travels, making their way down the river to the ocean, where they again change their name to grilse, and this time their dress as well, being now clothed in beautiful silvery scales.

"Here they apparently forget all about their fresh water origin and seem to say, 'At last we are really in the swim; please don't remind us that we ever lived away up country.' They change their name to Salmon and live four or five years gloriously, without a care in the world, and grow fat and frisky. But then, they begin to yearn for change, they are grown up and want to go home, so each takes a mate and off they go headed for the old home waters. It is a perilous way and many fail to arrive, being caught on the way, but those who do win through set immediately about leaving their eggs in the shallow gravel nests just as their parents did before them.

"By this time they are tired out and ready to leave the world. Most of them do. But so strongly has the name-changing habit taken hold of them that those who do not die are now called kelt. It doesn't matter anyway—they're no good at all except as food for some Indian's dog team—but that's no glory to a fish who has been king of the waters ever since he was hatched. So there we are, Billy Boy, right where we started from, ready to do it all over again."

"Well," said the boy named Billy, "no old leaper was ever eaten by any one who relished him more than I have this one, if that's any consolation to him. What is there for dessert?"

ABOUT THE MONTHS AND DAYS

"Make me over, Mother April . . .
From the rag-bag of the world."

BIG SISTER was reading aloud snatches of Richard Hovey's poem, *April.*

"That's about the way the names of our months and days have been collected, isn't it?" she asked Somebody. "From the rag-bag of the world?"

"Just about," replied Somebody, smiling.

"Oh, tell about it," urged Billy, always eager to know about real things. "What about January?"

"Oh, January, you know, of course, was dedicated by the ancient Romans to Janus, the god of doors and gates. He was represented as having two heads, able to see both the past and the future. February, named for the goddess Februa, and formerly the last month of the year, was the month of purification, getting rid of the old and outworn, preparing for the new. The name of March comes from Mars, the god of war. As you remember from the *Really-So Stories*, March was formerly the first month in the year.

"There is a little difference of opinion about April. Some say it came from a Latin word meaning to open, which surely would be appropriate in the spring, others say it came from Aprilis, one of the names of Venus, goddess of love. May is from Maia, one of the Pleiades. June is named for the goddess Juno.

"Now we leave the gods and goddesses, and look to

some emperors. When Julius Cæsar rearranged the calendar, the month in which his birthday occurred, called Quintilis, the fifth, was named July for him. August was named for the emperor Augustus, since in that month the most important events of his life happened. Formerly it had been called Sextilis, the sixth month. And the names of our four final months are certainly rag-bag stuff, leftovers pure and simple, for September, October, November and December signify respectively the seventh, eighth, ninth and tenth, whereas they are of course, in our present system, the ninth, tenth, eleventh and twelfth."

"Thank you very much," said Billy. "That takes care of the months. Now how about the days? I know some of them. Sunday, of course, was dedicated to the sun, and Monday to the moon. But Tuesday I don't know."

"Tiu was the god of war among the Angles and Saxons. Now I'm sure you know the others."

"Well, let's see. Wednesday is named after Woden or Odin, chief of the gods, and Thursday is Thor's day."

"Yes, he was called the Thunderer. He rode in a chariot drawn by two goats, Tooth-cracker and Tooth-gnasher—at least the Angles and Saxons thought he did. The thunder was said to be caused by the noise of his chariot. Two goddesses, Freya and Frigga, are mentioned as giving Friday its name, but Reginald C. Couzens, in his book, 'The Stories of the Months and Days,' points out that very likely they were one and the same person. Saturday is said to be named for Saturn, the father of Jupiter. When Jupiter was so rude as to overthrow his father, Saturn descended to earth and founded a kingdom called Latium. But some claim that Saturday is really Saeter-daeg, the day of Saeter, that being another name for Loki, god of fire, according to some of our distant ancestors."

"Well," said Billy, "I agree with Sis that it's quite a bunch of remnants. But I'm much obliged to you, Somebody."

Shoemakers
(16th Cent. woodcut)

A PAIR OF SHOES

"SOMETHING from the shoe store," announced Little Sister, taking the parcel the delivery man had brought to the door. "Must be for you, Billy—looks big enough."

Billy grinned. "That'll be about all from you, young lady. But I was expecting a package. Toss it over!"

"No, I want to open it."

"Oh, well, children have to be amused," he said loftily. "Aren't they keen?" he exclaimed, when she had taken them from the box. "Only I'd rather go barefooted."

"I imagine you'd find it rather inconvenient in the climate we live in," said Big Sister, as she hung the canary where he would get more sunshine.

Billy turned to Somebody. "Who ever started this custom of wearing shoes, anyway, please?"

Somebody laughed. "I suppose that someone, who cut his foot or stubbed his toe, wrapped grass or leaves around his feet, tying them on with vines. And probably someone who used animal-skins for clothing took pieces of the pelt to tie around his feet. From such humble beginnings must have come the sandal, which was made of woven grass or straw, papyrus or leather. But the Egyptians and the Assyrians wore high boots when they went to war."

"How interesting!" exclaimed Billy. "Please tell me some more."

"Well, when shoes began to be more varied, the Greeks had slippers for women and high laced boots for hunters. There were boots with high soles for the tragic actors. The Romans had sandals, or soft shoes, for dress occasions. The soldiers wore hob-nailed sandals fastened with straps called caligas.

"Soft uppers came into general use in the Middle Ages. Leather soles were sewed to the feet of tights to form the interesting 'stocking boots.' Boots were sometimes turned over at the top and trimmed with fur."

"Sounds like 'What the well-dressed man will wear'," said Billy.

"Yes, indeed. Pointed toes became the rage in the thirteenth century, and in the next century became *so* long that they had to be turned up and tied to a knee-garter. Then broad and square toes became the fashion."

"What's the sense of fashion, anyway?" queried Billy.

"Perhaps life would be monotonous without it," suggested Big Sister.

"Maybe yours would, Sis," said Billy, grinning. "And what was the next reel in the shoe movie?"

"The next reel in the shoe movie was the vogue of high heels and thick soles, in the time of Queen Elizabeth. The Queen's own shoes added three inches to her height. Then high heels and low heels, and toes round, pointed, oval and blocked followed each other as the years went by. Rosettes, gold braid and lace were used as trimming by the nobles."

"By the men?" asked Billy.

"Oh, most especially by the men. They wore boots with saw-tooth or curved tops and gold tassels in front."

" 'My name was Captain Kidd as I sailed, as I sailed'," quoted Billy.

"Yes, I don't doubt that Captain Kidd wore very fancy boots indeed, when he was all dressed up. Of course you

know about the wooden shoes of Holland and some parts of France, but perhaps you didn't know that they are used by some communities of foreigners in our own country now, as well as in some chemical factories."

"I didn't know that," said Billy. "Most of our shoes are made in Massachusetts, aren't they?"

"Well, of course, Massachusetts has been a leader in shoemaking ever since Thomas Beard, on the third voyage of the Mayflower, brought over full equipment for the making of shoes. Seven years from that time Philip Kertland was making shoes in Lynn, Massachusetts, and that city has always led in women's shoes, while Brockton has made most of the men's shoes. But now a great many are made in other states.

'In the early days," continued Somebody, "a shoemaker often took with him his traveling shop, which consisted of a bench, on one end of which he sat, the other end being fitted up with his tools and hides. The first machine for shoemaking was brought out in 1810. Now a pair of shoes can be made in just a few minutes."

"Where did that old saying, 'Shoemaker, stick to your last,' come from?" asked Billy.

"I'm glad you asked that," replied Somebody, "because it is generally misquoted to mean 'Do only your own line of work,' and it doesn't mean that. A shoemaker once criticized the drawing of a shoe by the Greek artist, Apelles, and Apelles gladly made the correction. Then the shoemaker started to criticize the rest of the picture, and Apelles told him not to find fault with anything above the shoe, since he was not an authority on other matters."

"Some story to a pair of shoes, isn't there?" said the boy named Billy.

ABOUT MADONNAS

"BOB WHITE'S aunt has sent him from Italy the prettiest postcard I ever saw," said Billy. "It's a very sweet-faced lady—looks something like Mom—and she's holding the cutest baby with chunky ankles."

"That must be a photograph of the Madonna della

Gran Duca, one of Raphael's paintings in Florence, Italy," said Somebody. "It represents the Virgin Mother and the Holy Child, so you have paid your mother a great compliment."

"I'm glad," said Billy. "But why has it that name?"

"Madonna means 'My Lady' in Italian. That word has come to mean the Virgin Mother, and this particular painting was the favorite of the Grand Duke."

"I'm not surprised," replied Billy.

"But there are many other wonderful paintings of the same subject by the greatest artists in the world. The most famous of all is Raphael's Sistine Madonna. Someone has said that angels must have mixed the colors for it. His Madonna of the Chair and Madonna of the Garden are also very famous. And there are other great pictures of the Madonna and Child in Italy, Germany, France and other countries."

"Have we any in this country?"

"Indeed we have—some very important ones. Raphael's Colonna Madonna is in the Metropolitan Museum of Art in New York. A famous Madonna and Child by Botticelli is in Boston at the Isabella Stewart Gardner Museum, which, like the New York gallery, also has a Bellini and other fine ones, and there are other notable pictures in the United States."

"I'd like to see them all," said Billy.

"Well, maybe you will some day," said Somebody, with a smile.

SNOW-CRYSTALS

"WHEE!" cried the boy named Billy, watching the scurrying snow-flakes. "If this keeps up, I can use my snowshoes."

Plop! went a big snow-flake against the window-pane right in front of his nose, as if to say, "Don't worry! We mean business this time!"

"Oh, Somebody!" called Billy. "Please come quick and see these beautiful snow-crystals."

Some were many-branched like coral, and some, Billy thought, looked like Mom's garnet brooch, only they were white, and all of them were six-sided.

"Why is that?" asked Billy.

"All I can say," replied Somebody, "is to repeat what science teaches—that it is due to the natural laws which govern the crystallization of water."

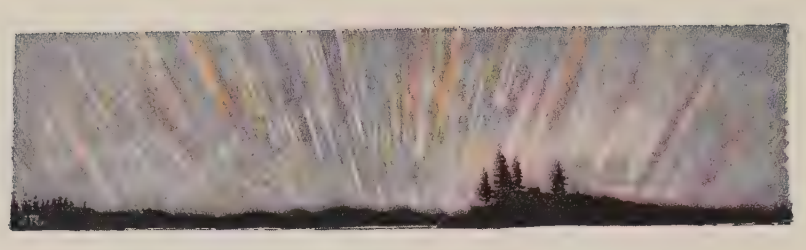
"There seem to be no two exactly alike," said Billy, looking at the gathering heap on the outer sill.

"No, but there are only a few general types here. There are many varieties of crystals, but only a few kinds fall in any one storm. See this one that looks like a cuff-button. It is a compound one, made up of the two principal kinds, the columnar and the tabular, joined by a little bar."

"I'm glad we live where there is snow," said Billy.

"As a matter of fact," replied Somebody, "snow forms everywhere in the world, but in the warmer regions it melts before it reaches the ground."

"Well, this is reaching the ground all right," said Billy, "and I think it's going to stay. I'd better take a look at those snowshoes."



THE AURORA BOREALIS

"COME into my room, everybody!" said Somebody from the stair-landing, "and see the moving pictures."

Billy bounded up the stairs, and the others followed more quietly. The wide north windows of Somebody's room showed a dazzling display, brilliant colored streamers, brightest toward the bottom, flickering and waving above a wide arch of silvery light.

"Northern lights!" exclaimed Billy.

"The aurora borealis," said his mother.

The display changed constantly as they watched it. Sometimes the light would die down until there was only a thin line of it, then the rays would shoot up again, more brightly than before, and pulses of light throbbed through them. The moon was shining, but it seemed pale in contrast to the luminous fingers.

"This is one of the most brilliant Auroras I've ever seen in this latitude," said Uncle Ned, "but in the Arctic region I've seen the serpentine Aurora, rising in many-colored coils from horizon to zenith."

"Wish I had been there," said Billy. "How high do you suppose these streamers go?"

Somebody answered, "Scientific men have discovered that the lower strata measure from fifty to one hundred miles, and the upper strata from seventy-five to two hundred miles. You would scarcely believe that such a beautiful sight was thought to be a sign of coming calamity until the end of the seventeenth century in Europe. Large

numbers of people went on pilgrimages to pray together to avert the evil days. They thought the lights were armies fighting in the air."

"Imagine!" said Big Sister.

"Bob White's grandfather says the Aurora is caused by spots on the sun," said Billy, "but I'm afraid I can't believe that."

"Well, I've heard almost everything blamed on sun-spots," replied Somebody, "so I'm not surprised that you're skeptical. However, in this case there really does seem to be some connection. Sun-spots are said to be caused by violent gaseous disturbances on the sun's surface. They are now being studied by four great American observatories, working co-operatively. Auroras occur at the same time, but their exact cause is one of Nature's mysteries not yet fully solved. There are several theories. The one most widely credited now is that they are due to helium thrown off by the sun, stopped in the rarefied upper atmosphere of our earth. But science does not yet say, 'We *know*,' in regard to this. The aurora seems to be accompanied by magnetic disturbances."

"Is it true," asked Billy, "that tne aurora affects the radio?"

"Some people say so, and yet Donald B. MacMillan, on his way to the Arctic, passed right under the aurora and did not notice any effect on his radio."

"There are auroras in the Southern hemisphere, too, aren't there?" asked Big Sister.

'Yes, the aurora australis, but nothing was known about it in Europe until the middle of the eighteenth century."

"See!" said Billy, "the streamers are growing shorter, and the light-patch that was on the left is entirely gone."

"Yes, our show is about over for the present," said Uncle Ned.

"Well, thanks for letting us know, Somebody! That was a mighty good movie," said the boy named Billy.

Money Lenders
"(16th Cent. print)"

ABOUT INTEREST

"OH, goody," said the boy named Billy, waving his bank book in the air. "Look at it. I have nearly a hundred dollars saved up. The man at the bank tells me that next quarter, when I have the interest added, it'll be a little more than a hundred. Won't somebody please tell me why the bank pays me for leaving my money there, instead of making me pay to have it kept safely, and who *invented* interest, anyway?"

"I'm glad that you have brought up this question, Billy," said Somebody, "because when you once understand the principle of interest you'll begin to take an interest in saving your principal."

"Well, but tell me who did invent interest," said the boy named Billy, with a twinkle in his eyes. "I'm sure it will be an interesting story."

"Long ago, in olden times," said Somebody, "it was not considered neighborly or kind to exact interest from anyone who was obliged to borrow money. It was like taking advantage of his need, because nobody borrowed unless he was obliged to. The term for that in those days was 'usury' meaning use, and coming from the Latin word 'usura'. The idea was used not alone for money, but for oil or flour or wine. But if one borrowed, he must in returning the article add a little more than the measure of what he had borrowed, to show his gratitude and honesty.

"The borrowing and lending of money became a business among the ancient Hebrews, and being carried on for the purpose of making money, it became possible for the borrower to pay to the lender a certain agreed-upon percentage. To prevent the lender from charging the borrower too much for the use of money, laws were made fixing the amount it was lawful to charge."

"But," said the boy named Billy, "I do not loan my money to the bank. I just leave it there for safety. Why, then, should they pay me interest?"

"The bank," answered Somebody, "makes a business of taking care of money, but they do not keep it there in heaps and rows, but loan it out to other people who need it. Suppose, for instance, Farmer Brown wants to build a barn. He hasn't enough money, although he has a big farm, with horses, cows, pigs and chickens, which he cannot sell because he needs them all; so he asks the Banker to loan him the money to build his barn. The Banker says, 'All right, Brown; you're good for it. The money will cost you six per cent a year interest.' So you see, as the Banker pays you three per cent on your money and loans it to Farmer Brown for six, that he is making fully as much on your money as you are."

"But suppose that I need to use my money while Farmer Brown has it; must I wait until he pays it back to the bank?"

"Indeed not," said Somebody, "because it is the banker's business to have enough money in his bank all the time so that if you really want your money he can pay it to you. And besides, of course, not all the people who have money in the bank would want it all at the same time."

"But does that ever happen?"

"Sometimes, but not often," answered Somebody. "Not if you are doing business with a good bank."

"I'm glad I've got a good bank," said Billy, "because all the money I can save is going to keep right on earning interest until I'm old enough to go to college!"

MAY DAY

"HOW time flies!" said Billy's mother. "Tomorrow will be May Day."

"Yes," said Billy, "and I suppose our doorbell will ring tonight about a million times, and the front porch will be littered up with May baskets for Little Sister."

"That doesn't worry me," replied his mother smiling. "But I have to see that Little Sister has a white dress ready for the exercises. She has been chosen May Queen for her grade."

"Who ever started all this May Day foolishness, anyway?"

Billy's mother had gone to attend to her task, so Somebody answered:

"Would you call spring foolish, Billy? Having the grass and the flowers again, and the birds come back?"

"Of course not."

"Well, from the earliest times people had games and dancing to express their joy at the return of spring. You

THE STORY OF ROBIN HOOD WAS ACTED OUT

see it brought back comfort and beauty after the winter, and besides, new crops could be planted and tended so that all could have food. The custom is thought to have started in the Orient, sweeping across Greece and Rome, and then being adopted everywhere.

"In France the prettiest girl was chosen as May Queen, and her attendants went around collecting money to buy the holiday feast. In Scandinavian countries there was a fight between two men dressed to represent Winter and Summer, with Summer winning. And of course you know about the English custom of 'bringing in the May.' "

"Well, I know a little," said Billy, "but I wish you would tell me about it."

"Early in the morning," said Somebody, "the girls would wash their faces in the May dew, which was supposed to make them prettier, and then everyone would troop along in search of the tallest and straightest tree. This would be dragged back by thirty or forty yoke of oxen whose horns had been hung with garlands. The pole, stripped of its leaves and wound with ribbons, was set up, and then there was a dance around the tree, the young people each holding a ribbon. During the merrymaking, the story of Robin Hood was acted out; the people took the characters of Maid Marian, Will Scarlet, Little John and the rest, with Morris Dancers adding to the gaiety.

"Sometimes, even after the party was over, the Maypole was left standing as a sort of community center for other good times. But the Puritans thought the custom a frivolous one, and Parliament passed a law forbidding Maypoles. When this law was repealed, a gigantic Maypole was erected in the Strand in London, but by that time nearly everyone had lost interest."

"Well, Little Sister hasn't lost interest," said Billy. "And, anyway, I hope she has a good time being May Queen, tomorrow."

SOMETHING ABOUT MUSHROOMS

"PETE and his Dad have just come back from a trip to the Corners in their car," announced Billy. "They brought back a big basket of mushrooms. They offered me some for the family, but I was afraid some of them might be toadstools."

"You mean that, though some of them might be good to eat, others might be very bad to eat," said Somebody. "The word 'toadstool' is only a fanciful expression, originating in the quaint idea that a mushroom would make a good article of furniture for a toad. Artists have used the idea, and now ever so many people say 'toadstool' when what they really mean is an inedible mushroom."

"Well, I won't make that mistake again," said Billy. "From now on I'll say a mushroom is either edible or inedible, good to eat, or not good to eat."

"Bully for you," replied Somebody.

"But do you suppose," persisted the boy, "that there's any chance that Pete and his Dad may have got hold of some inedible ones, that would make them very sick?"

"No, because Pete's father is an authority on mushrooms. He has been gathering them all his life, and has made a study of the subject."

"How does he know the good ones from the bad ones? Are there any set rules to follow?"

"There are rules, but since there are exceptions to all of them, I think it is better for people who are not experts to learn certain edible kinds, and let the rest alone. Pete and his father probably gathered some of the best-known

of all the many varieties, the common field-mushroom, *Agaricus campestris*. It grows plentifully in Mr. Garland's pasture near the Corners, and as Mr. Garland's family doesn't care for mushrooms, he doesn't mind if other people take them. There are pink 'gills' on the underside of the 'umbrella,' which become brown when the campester is older and larger. But right along with them, in that same pasture, grows a dangerous all-white variety, so it is necessary to be *very* careful to distinguish between them."

"I should think so," said Billy. "What are the button mushrooms, such as we have in the sauce with steak sometimes?"

"The button mushrooms are just the little new ones of the campesters, and they are called buttons on account of their shape. Some people insist on getting the 'genuine button mushrooms,' thinking they are a separate variety, whereas they are only the 'babies.' It is unwise for people gathering wild mushrooms to pick the 'buttons.' They are too small to distinguish easily from other varieties."

"My! that's interesting to know. What other kinds are good, that a person could just remember easily, without being an expert?"

"Well, the puffball, of course."

"Puffballs! I supposed they were only good to step on and see the 'smoke' come out," exclaimed the boy.

"That's when they are old and have gone to seed. But as long as the puffball is pure white all the way through, it is delicious. Sometimes, though, they look white and firm on the outside, when they have begun to be yellowish on the inside. That's why I always cut or break them open before they are cooked, to make sure."

"Oh, do you ever hunt mushrooms, Somebody? May I go with you, sometime?"

"Surely. When I was visiting on the Fuller farm, last week, I found a puffball up near the big pine-tree that must have weighed over a pound. We sliced it and fried it,

and everyone enjoyed it—even the hired man. I wish you had been there."

"I wish I had!"

"Well, I'll tell you what we'll do, Billy. We'll watch for the shaggy-manes. They ought to be coming along pretty soon, and down under those willows near the brook is an ideal place for them to grow. They wouldn't have the heart not to grow there. We'll ask your father to notify us when he sees some poking their heads up on the golf-links. They love to grow there, too."

"Small chance! When Dad plays golf he sees nothing but golf."

Somebody laughed. "All right, we'll keep our own eyes open, then."

"Why are they called shaggy-manes?"

"Because that's exactly what they look like,—a shaggy mane. Another kind that you would recognize easily from its name is the honeycomb mushroom, also called the morel. It's like a thick finger with a honeycombed surface. It is one of the few edible kinds that grow among the trees. It comes in spring, and is as sweet as its name. But I can't think of any reason why you should not grow your own mushrooms down in the cellar. You might interview your father and mother on that subject."

"Oh, I'm sure they wouldn't mind," said Billy. "They always let me do anything *reasonable*, and this must be, or you wouldn't have mentioned it. How do I start?"

"You will have to get some 'bricks' of spawn from an established mushroom industry, and directions will be given with them."

"What kind shall we raise?" asked Billy, delighted.

"As to that, we are limited to one kind. The *Agaricus campestris* is the only kind that has yet been successfully cultivated, so far as I know. But I think you'll be satisfied with that."

"I know I shall," said the boy named Billy.

ABOUT MARGARET HAUGHERY

"TEACHER said today that we had lately been paying a good deal of attention to our great men, and that it was only fair that we should now find out something about our great women," said the boy named Billy. "I did not know that we had any great women in our history; great the way Washington and Lincoln were as men."

"What about Clara Barton?" asked Big Sister.

"I know about her of course," said Billy, "but I want to know about somebody great enough to have a monument erected to her memory and everything, like Joan of Arc."

"Well, one woman in the United States to have had a monument erected to her memory," said Somebody, "was an Irish washerwoman who never had learned to read or write her own name."

"*A washerwoman!*" exclaimed the boy named Billy, "and Irish at that! This surely sounds like a really-so story. Let's go!"

"Margaret Haughery," said Somebody, "was born in Baltimore to a young couple who had just come over from Ireland, so of course she was a real American; her parents, who were very poor, died when she was two years old, leaving the baby all alone and penniless.

"She was cared for by a Welsh lady named Richards, whose husband had recently died. Mr. and Mrs. Richards had come over from 'the old country' on the same boat with Margaret's parents. Even though she herself was a staunch Baptist, Mrs. Richards felt it her duty to bring Margaret up as a Catholic, as her parents would have wished.

"There was no money for educational purposes and Margaret went to work as soon as she was able as a laundress, and when she was eighteen married a young Irish immigrant, just over, and not very strong. For the sake of the climate they moved to New Orleans, but he was unable to work and soon after their baby was born he died.

"So there Margaret was, only twenty, a widow, with a sickly baby to rear. She put the baby in a convent and obtained a position as laundress in the St. Charles Hotel. Then the baby died. That was hard, but there were still other babies needing milk and good care in the world, many of them right there in the convent.

"So Margaret with her savings bought a cow, and sold the milk after hours, to poor people who could not afford to pay high prices. Soon she had enough money to buy another cow; then she bought a cart; and more cows, and gave up her laundry work. Sun or rain mattered not to Margaret; she was always on her route, selling her milk, and collecting

food from the hotels and fine residences for the needy little ones at the convent.

"By now Margaret was a power both in money and personality. People came to her to borrow money. One creditor not paying his debt, she was obliged to take his shop, a bakery, which she proceeded to enlarge and make more valuable.

"Now she sold the milk route, and gave all her attention to making bread—real crusty French bread instead of the broken bits with which she had been obliged to feed her orphans.

"Now that she could feed them, she established an orphanage for foundlings; she called it her baby house. No little newsboy could go hungry to his work; his breakfast of crusty rolls and butter waited for him at Margaret's. No one needed to go hungry if he was worthy of charity, for Margaret never turned any one away. She saw the need for a training school for girls and established one.

In spite of her large charities Margaret grew rich, and prospered. She needed nothing for herself. Always, year in, year out, she wore the same old calico dress, spotlessly clean, and the same old rusty sunbonnet and thick shoes.

"But at last, Margaret died: then it was that New Orleans saw her real worth. Both rich and poor went to her funeral; the great city papers appeared in mourning, and immediately a fund was started to erect a monument to a great heart, and before it was fully realized that she had gone, she was sitting almost at her old door, smiling her motherly smile and wearing her same rusty old garments."

"What became of her money?" asked the boy named Billy.

"She left one half to the Catholic orphanage, and the other to the Protestants," said Somebody.

"A fine person!" said the boy named Billy. "I hope to see New Orleans some day, when we go traveling."

AEROPLANES AND "FIRSTS"

"OH, shucks!" said the boy named Billy. "It seems as if everything worth doing has been done! Colonel Lindbergh was the first to fly across the Atlantic to the European continent, Alcock and Brown first having flown from Canada to Ireland, a narrower part of the ocean; Commander Byrd was the first to fly over the North Pole; Rear-Admiral Peary was the first to reach the North Pole by any means, whatever; Captain Roald Amundsen the first to reach the South Pole; Costes and Le Brix, taking air-mail, were the first to make a non-stop flight across the South Atlantic. George Washington was 'first in war, first in peace, first in the hearts of his countrymen.' It seems as though everything has been discovered and invented and

ORVILLE WRIGHT IN HIS GLIDER, AT KITTY HAWK, 1903

done, and all there is left for a fellow to do is to trail along at the end of the procession!"

"*What* has happened to William?" said his mother. "Never have I heard my boy say so much at one time—and with a grievance, too."

"Billy," said Somebody, "think a minute! Commander Byrd said he never could have *located* the Pole without his sun-compass. And how did Lindbergh get to Paris?"

"Why, in his aeroplane, of course, 'The Spirit of St. Louis,' the other part of 'We'."

"Who built his aeroplane?"

"I *ought* to remember what make it was, but I just don't. Anyhow, every aeroplane maker owes a great deal to Wilbur and Orville Wright."

"Yes, not only for what they, themselves, accomplished by all their patient experimenting, but also for what their efforts inspired others, such as Santos-Dumont and Bleriot, to do. But where did the Wright brothers get the idea?"

"Well, I've read that when they were children someone gave them a toy glider, and they wondered whether one couldn't be built big enough to carry a person. When they were older they tried it, and kept on trying."

"Yes," said Somebody, "and others before them were trying to build 'flying machines,' notably Professor Langley of the Smithsonian Institution. But before Langley there were others trying, and before them were the makers of balloons. And long before them was Archimedes, who discovered principles that inventors have been making use of ever since."

"I begin to get you," said Billy. "You mean that all the inventions and discoveries have been made possible by someone else who has paved the way."

"Yes, that's looking backward. And looking forward, everyone's discoveries form the basis for the discoveries of the future. There are plenty of things left to be first in, after all."

"Well, that's some comfort," said the boy named Billy.

ABOUT MAPLE SUGAR

"OPEN your mouth and close your eyes and I'll give you something to make you wise," chanted the boy named Billy as he came running into Somebody's room.

"Um, mm, Maple Sugar!" said Somebody opening Somebody's eyes in surprise. "Wherever did you get it, Billy Boy?"

"Uncle Ned is up in Eastern Maine and he has sent Mom a whole big box of it," said Billy. "Isn't it good? How do they make it?"

"I used to help make it when I was a youngster," said Somebody, "and I shall never forget what fun it was."

"We used to get up early in the morning before the sun did, and put on our snowshoes and run out to the sugar orchard to get the buckets in place before the sap began to run, and back to breakfast; nothing ever tasted so good as Mother's hot buckwheat cakes with new maple syrup after a run like that."

"Tell me how you made it," said the boy named Billy.

"Well, then," said Somebody, "in the spring of the year the sap, or blood of the tree, which has been resting all winter, begins to circulate again to send life to the new buds and flowers and foliage. And of course the weather must be just right—it must be still cold enough so that it freezes slightly

at night, and warm enough so that the sap will flow freely in the day time. Only the sap of the hard maple contains enough sugar to make tapping worth while. In the hard maple the sugar maker bores a slanting upward hole with a sharp augur into which he inserts what is called, in the sugar country, a 'spile,' which is a tube, or a grooved piece of wood. And the spile must fit snugly else the precious blood of the maple will be lost.

"No tree must be asked for its sap before it measures at least ten inches around, as a young tree needs all its own vitality; but if carefully tapped and the wound thoroughly closed again, it does not at all harm the maple, which goes calmly on about its business of looking beautiful and raising twin seed babies on a large scale.

"Each evening the sap is 'gathered' and poured into a large kettle over a rousing fire, usually built on the ground, in the sugar orchard, and is boiled until it is just the right thickness for syrup.

"That's about all there is to it if it is for home use, because most people prefer the syrup to the sugar, but if you are going to make sugar it is a most delicate process requiring real knowledge, and must be done by some one who is both careful and dependable. It must be stirred constantly to prevent burning, and must be removed from the fire at just the right moment!"

"Is the hard maple the only tree which gives us sugar?"

"As yet it is," said Somebody, "although a botanist from Canada claims that the Douglas Fir tree, if rightly understood, will do as well. So far, though, the only sugar from the Douglas Fir costs a great many dollars a pound, which would discourage almost any sweet tooth, don't you think, Billy?"

"I'm willing to sample it whenever they send us any," said the boy named Billy. "But in the meantime I'm pretty grateful to Uncle Ned for sending us the maple sugar. Now if we only had some of those real old State of Maine buckwheats—oh, boy!"

Drum beaten at the Battle of Lexington

YANKEE DOODLE

"Yankee Doodle came to town,
Riding on a pony,
Stuck a feather in his hat
And called it macaroni."

BILLY sang at his work. He was trying to put a good smooth surface on a handkerchief box he was making for his mother's Christmas present. Little Sister stuck her head in at his attic workroom.

"Billy!" she said, "I'm trying to be very good before Santa Claus comes, or I'd tell you that was the tune the old cow died on."

Billy laughed. "I understand your meaning perfectly, youngster, but if I see Santa I won't tell him what you said. Anyway, I think the old song means something interesting. Let's go ask Somebody, as soon as I plane this a little more."

They found Somebody in the library, glad to answer their questions.

"Yes, it's an old song, and has quite a history. People have evidently always liked the tune, for they have used it for religion, for work, and for war."

"How was that?" asked Billy.

"The air which we know as 'Yankee Doodle' is said to have been used in the service of the Catholic Church in Italy in the tenth century. After that the workers in the vineyards all through Southern Europe sang it. Somehow it got to Holland, and from there to England, where, in Shakespeare's time, it was sung to the words of 'Lucy Locket lost her pocket.' The Dutch had sung some meaningless words to it, beginning with 'Yankee dudel.' Probably when they first heard it, the words had a meaning in some other language, which they did not know. At any rate, when Cromwell rode from Canterbury to take command of the Puritans, the Cavaliers are said to have sung the song almost as you know it in order to make fun of him."

"And why should he call the feather macaroni?" asked Billy.

"After the place it came from. Macaroni comes from Italy, and everything Italian was at that time thought very stylish. They were ridiculing Cromwell because he was *anything but* stylish, of course, and for that same reason our own colonial forces were ridiculed when the English sang the song at them during the French and Indian war. The American troops were untrained, poorly dressed, and poorly equipped, and the English soldiers sang 'Yankee Doodle' at them in derision.

"But the American soldiers liked the idea. They adopted the song, sang and whistled it, and during the Revolution it was heard in every American camp. When Lord Cornwallis came over to America, he had to listen to it from all directions, and he said he never wanted to hear it again. But he had to hear it again when he surrendered at Yorktown. Ever since it has been considered one of our national airs."

"Thank you very much, Somebody. Now, youngster, aren't you sorry for what you said?"

"What did she say?" asked Somebody.

"I promised not to tell," said Billy, laughing. "Christmas is coming."

JET, AND THE STORY OF CAEDMON

"I NEVER noticed this necklace before in great-grandmother Ellen's picture," said Billy, holding the little plush and embossed leather case. "Was it really so black, or does it only look that way in the picture?"

"It really was as black as jet," his mother replied, "because it *was* jet. Your aunt Bertha has the necklace carefully put away. She'll show it to you if you ask her."

"What *is* jet, any way?"asked Billy. "Any relation to coal?"

"Well, a distant relative, perhaps," Somebody answered, "and nowadays anthracite here and Scotch cannel coal in Great Britain are sometimes used as substitutes for it. Logs carried by rivers to the sea probably sank to the mud of the ocean's bed. Here chemical action took place and the wood underwent, as so many things do, 'a sea change into something new and strange.' Originally, enough of it for ornaments was found on the seashore, but later it was mined."

" 'Perhaps' and 'probably'," commented Billy. "Don't people *know?*"

"The more learned a scientific man is," replied Somebody, "the more careful he is not to say he *knows* when he has only a theory, not a proved fact. Even when he thinks he has proved a fact, someone is likely to come along and check up on him, and show either that he was wrong, or that he saw only a part of the fact. Jet must have been used in Britain in prehistoric times, because jet rings, amulets, beads and buttons have been found among the relics of the Bronze age. When the Roman soldiers went to Britain they found an abundance of jet, which was obtained *probably* from the Yorkshire coast. The monks of Whitby Abbey used it for rosaries, and Caedmon referred to it."

"Who was Caedmon, please?"

"Oh, there *is* a story. Caedmon was a poor herdsman who worked for a bailiff near the monastery of Whitby. At that time—this was in the seventh century—it was the custom in the evening, when work was done, for each one of a merry gathering to make up some verses, and play a little on the harp as an accompaniment for his song. But Caedmon couldn't compose any poetry; he couldn't sing, and he couldn't play the harp. If he lived now he would call himself a perfect 'dumb-bell.' When the harp began to be passed from one to another, so that all might contribute

to the entertainment, Caedmon would go out quietly and hide himself somewhere."

"Poor Caedmon!" said Billy. "I know just how he felt."

"One night, when he had escaped from the company and was sleeping in the stable, he had a dream. He thought a stranger stood before him and commanded him to sing. Caedmon told the stranger he couldn't sing, but the dream-visitor insisted that he could, and that he must sing about the creation of the world. So in his dream Caedmon made up a poem about how God created the wonders of the world.

"When he woke up," continued Somebody, "he could still remember the words of it, and he was so surprised that he went straight and told the man he worked for. The bailiff thought that since this was religious poetry, the people at the monastery would be interested in it, so he took Caedmon to see Hild, the Abbess. She told Caedmon some Bible stories, and Caedmon, determined to obey his dream-visitor if he possibly could, by the next day had turned the stories into poetry in the Northumbrian dialect, which was all he knew.

"They took him to live at the monastery after that, and the monks told him Bible stories, all of which he turned into verse. Up to then, Bible knowledge in England had been limited to the high-born and educated classes, who knew Latin. And verse in the common language of the people had been used only for more frivolous subjects. But Caedmon, by giving the people religious stories in language they loved to hear, spread the gospel far and wide, and was a tremendous help in making Christianity known. His verse became so popular that many people imitated it, both in England and in other countries."

"He must have been very glad he could do so much good," said Billy. "Thank you very much for telling me that dandy really-so story. And I surely do want to see the jet necklace."

COMMON SALT

"DAD says that the new bookkeeper isn't worth his salt," said the boy named Billy. "That's just the same as saying that he is absolutely worthless."

"Pretty nearly, as we use the expression," said Somebody.

"Where did the expression come from?" asked Billy.

"I suppose it grew out of just such experiences as Daddy is having with this new man," said Somebody, "only it was probably more nearly true in those cases, because salt was in olden times very scarce and therefore very valuable. If the laborer was not worth his salt he was not worth his pay.

"The word 'salary' is derived from the Latin word 'salarium,' which came from 'sal,' meaning salt. The Roman soldier was always given an allowance of money with which to pay for his salt.

"The early Saxons had a salt stand which marked the place at the table, at which every one ate. The salt separated the master and his invited guests from the servants and dependents. No one except equals were seated above the salt.

"The old Normans had the same custom, but their word for the salt container was 'saliere' which with us has become 'salt-cellar.'

"Salad also comes from the word 'salt' on account of the custom of using salt on the green vegetables."

"How did salt become so cheap then?" asked Billy.

"As the world progresses new ways of obtaining things are discovered," said Somebody. "We now have extensive salt mines in many parts of the country, left there by the evaporation of ancient seas. Also salt is readily obtained from the evaporation of sea water, and of such salt works we have several in the United States."

"Funny old world, isn't it?" said the boy named Billy.

NEAR LEWISTON ONE WAS CAPTURED . . .

ABOUT MOOSE

"I'VE just been clearing out some school papers that I don't need any more," said Billy, "and I came across an old letter from Cousin Raymond, who lives in Brewer, Maine, right across the river from Bangor. He told about a young bull moose he saw in the fall, walking right down the railroad track, in the heart of town, acting as if he owned the earth. The moose turned off, not far from the Baptist church, and went on in the direction of South Brewer. And a young 'cow' moose went past Raymond's house in June. I wish I'd been there!"

"I understand that, for some unknown reason, several moose invaded Maine cities during 1927," said Somebody, "or were seen close by. Near Lewiston one was captured, but I never heard whether it remained in captivity. And near Bangor a moose, one night, charged full-tilt into the lights of a man's automobile, and broke the windshield and the mudguard. Evidently he thought that glaring-eyed creature was an enemy. Of course, it is unusual for moose to be seen outside the woods, but the unusual seemed to be happening, that year."

"When I see a moose," said Uncle Ned, "I give him the right of way. He might step on me by accident, or I might get too close to those shovel-shaped solid bone antlers of his. Once, when I was up in the north woods, I came upon one unexpectedly, at the edge of a lake. He looked as big as a house. 'Mr. Moose, this is your lake,' I said. 'You found it first, and you can have it all to yourself.' But before I said it, I put plenty of distance between me and that moose."

"Why, I didn't suppose you were ever afraid of anything, Uncle Ned," said Billy.

"Your uncle is brave enough to admit that he can be afraid," said Somebody.

"Well, the bull moose is the largest quadruped of North America," said Uncle Ned. "He stands well over six feet, and weighs twelve hundred pounds, or more. His antlers sometimes have a spread of over seventy inches. Although they are so big and heavy, the moose sheds them every year, after his fighting season is over, and grows new ones next spring. At first these are soft, with blood circulating in them, but toward fall they harden. Mother Moose has no antlers. Her little moose-calves are born in May, or June—about thirty-two inches high, and nearly all legs—very funny to look at. But I assure you there's nothing funny about Father Moose when he's in action, and when he's coming my way, I want to know it beforehand."

"How could you know it?" asked Billy.

"The old hunters used to bring the bull moose by making sounds through a birch-bark horn, imitating the call of the cow moose. One of them could be heard half a mile away, crashing through the forest, breaking down dead trees and bushes in his headlong rush. Then when he came close enough the hunters would drop him with their rifles."

"Doesn't seem like a square deal for the moose," said Billy.

"It wasn't. Killing to protect human life is a different matter. The moose, like the other largest and strongest land-animals, is vegetarian. In fact his name comes from an Indian word meaning wood-eater. It would be a shame for this wonderful member of the deer family to become extinct. Now there is a law against the reckless slaughter of moose, and both the United States and Canada have areas set aside for them, where they may not be killed."

"Well, I'll never kill a moose," said Billy. "I'll do as Uncle Ned did, if I see one—just get out of his way."

"OH, cricky!" said the boy named Billy, as he came in from the lake with his hair all wet from his swim, "Monday is Labor Day, and school isn't going to open until Tuesday, and I can get one more good swim in the morning, and Dad says he will take me to the Big League game in the afternoon. Hooray!"

"Good enough for you," said Big Sister, "but I've got to help Mother with dinner because Nora has the whole day off."

"Never mind, Sis," said the boy named Billy; "we don't need much dinner and I'll help you dry the dishes, if you'll come and see the parade with me. Bob White is going to a picnic in the morning to be gone the whole day, or I'd ask him. And the grocery and the meat market and the post office and every place will be closed, Dad says, so everything you want for the house you'd better get today. And what I'd like to know," he went on, "is why it is called Labor Day, when nobody does anything at all except to have a good time generally?"

"It is a pretty big question," said Somebody, "and one that is hard to explain in a few words, even to a youngster who likes to know everything. In this connection the word labor does not mean *to labor*, but is meant to convey the fact that the day is *for* those who labor, and as that means every one in these good old United States of ours who is any good at all, of course it means *all of us!* So it seems fitting

that we *all of us* should have one day out of the year in which to rejoice that we have health and strength to labor, especially in such a land as ours, where everything in the world waits for one who will go out and work for it.

"But to be exact, the idea grew out of discontent. There was a secret society called the Knights of Labor, who were dissatisfied with what they called Capital as against Labor. They did not like the hours, nor the wages, nor the living and working conditions, and so in 1869 they set about trying to change all these things, but they did not gather much strength until 1882, when they came out as a Society and paraded in the streets of New York on the fifth day of September.

"They attracted a good deal of attention in one way or another, so much so that several states adopted the idea, and appointed the first Monday in September as a legal holiday, to be called Labor Day. So now it is observed in nearly all the states and territories."

"I've often wondered," said the boy named Billy, "why people ever do some kinds of work at all, such as sweeping streets and collecting ashes and being hod carriers."

"I've wondered, too," said Somebody laughing. "It can't be pleasant, yet old Beppo the street sweeper always whistles at his work and looks up with a smile when I pass him. And as such work must be done, we can do our part by being neat and orderly in our own habits of living, and be always cheerful and polite to those who must do the things we would not be willing to do."

"That's right," said the boy named Billy. "I've always been kind of sorry to see Sunday come—but I'll bet those fellows who do the hard work of the world all the week aren't!"

"No, indeed," said Somebody. "God was very wise and loving, and took care of all that in the beginning. He said, 'Six days shalt thou labor and do all thy work, but on the seventh day thou shalt not do any work'."

Newton's reflecting Telescope

1672

Leffershay's refracting Telescope 1608

TELESCOPES

"LET'S all go out on the porch and enjoy the stars." Billy's father switched off the lights in the living-room, and then the porch-light. As the family stepped outside, a shooting-star, as if to greet them, flashed by so fast that Billy had no chance to say, "Money, money."

"Beautiful!" said Billy's mother. "Thank you. Father, for thinking of it."

"There's the Big Dipper," said Billy, "and the Milky Way—and I know the Pleiades. Are there really just seven of them, or are there more that we can't see?"

"We can see seven with the unaided eye," answered Somebody, "but the Pleiades really consist of more than two thousand three hundred stars. We should be able to see them if we were looking through a great telescope, and we could see a hundred million stars in all, instead of the few thousand that are now visible."

"Where could we find one of these telescopes?"

"Oh, there are several in this country. In fact, the largest in the world are in the United States, and there is a powerful one in British Columbia. The largest refractor, at the Yerkes Observatory at Lake Geneva, Wisconsin, belongs to the University of Chicago, and the next largest,

at the Lick Observatory, is the property of the University of California. The largest *reflector* is at the Carnegie Institution on Mt. Wilson, California. Harvard has powerful instruments of both kinds, and there are other great ones in this country.

"What is the difference," asked Billy, "between refractors and reflectors?"

"In a refractor the light strikes a *lens* which brings the rays to a focus, and here another lens magnifies the image. In a reflector the light falls on a *mirror* which reflects it to the second lens in the upper part of the instrument.

"The most perfect glass," continued Somebody, "is necessary for refractors, since the light must go through it. For that reason they are smaller than reflectors, but they are considered the better instruments for general use, not being so sensitive to weather conditions as reflectors. The latter, though, are thought better for some types of sky-photography."

"How big is the largest instrument?" Billy asked

"The telescope at the Yerkes Observatory, the largest refractor, has a forty-inch lens, giving forty thousand times more light than the eye ordinarily receives. The largest reflector, at the Mt. Wilson Observatory, is one hundred inches in diameter."

"I hope I can see them sometime. Who invented the telescope, please?"

"Johannes Leffershay of Middleburg, Holland, made the first refracting one in 1608. As soon as Galileo heard of this, he set about making one, and soon was supplying astronomers with telescopes of his own invention. With instruments of his own manufacture, Galileo discovered four of Jupiter's satellites and made valuable observations of several of the stars and planets. And improvements in the instruments, and discoveries about the stars, continue."

"And always will, I suppose," said the boy named Billy.

Cleanliness is next to *Godliness*

"HOW nice and clean you look," said Somebody as the boy named Billy came in looking clean indeed, but, if the truth must be told, a bit sulky also.

"Clean," sputtered Billy, "I *should* look clean! I think the outside skin is all scrubbed off! That soap mother used is fierce. My eyes feel as though they would never stop smarting! What's soap made of and who ever invented it? I'll bet it wasn't a *man!*"

"Soap's the best friend you've got, Billy Boy," laughed Somebody. "You'd never be fit to be seen except for it, and you wouldn't be so very healthy either."

"Well—maybe—" said the boy named Billy. "But who did invent the stuff anyhow and what's it made of—something that smarts good and plenty, I know that!"

"Soap," said Somebody, "is a combination of alkali and oil, and was first made from goat's tallow and beech-ash; the manufacture of olive oil soap was established in the thirteenth century in Marseilles, France, and was introduced into England in the next century. The first soap known to commerce came to the Romans from the Germans."

"Did you ever see soap being made?" asked the boy named Billy.

"Yes, indeed, I have," said Somebody. "When I was little my grandmother used to make a year's supply every spring. It was great fun. First grandfather put a layer of straw in the bottom of a big hogshead with a spout near the bottom. Then he put in a layer of beech ashes from the

big fireplace in the living room which he had been saving all winter for the purpose; and so on until the big barrel was full, first straw and then ashes. Then when the day came for making the soap he built a big fire out-of-doors, put the iron kettle full of water over it, and when the water was boiling he poured it over the ashes in the barrel and let it drip through. When he had a kettle full of lye he put it over the fire to boil, put into it the tallow and scraps of fat that grandmother had saved up and boiled it all together until it was a beautiful amber color. Then he poured it into a big barrel."

"How did you ever get it out of the barrel?" asked the boy named Billy.

"Just dipped it out," said Somebody. "It was soft. We used it for washing and cleansing. The hard kind that we used for bathing came from Italy."

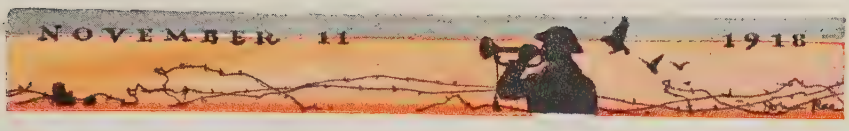
"How did people get along without soap before they knew how to make it?" asked the boy named Billy.

"Oh, I suppose they had some sort of substitute," answered Somebody. "There's some sort of vegetable substitute for it growing in most places if you know where to look. In Chile there's a tree called *quillaja saponaria*, the inner bark of which is used as a substitute for soap; and the Mexican mothers use the root of the yucca with which to scrub the small peons and their scanty clothing. While on the hills of California I often washed my hands with the blossoms of the wild lilac which makes a beautiful lather with the alkaline water of the mountain streams. There is also a wild lily plant that is so soapy that if you do not watch your step on a wet day it will send you slipping down the slopes in a hurry."

"I wish I lived where I could pick my soap from a tree," said the boy named Billy. "I know I'd like it better than the kind Mother uses."

"I suppose you'd gather some as often as once a week, wouldn't you, Billy?" asked Big Sister.

"Sure," grinned Billy, "if it didn't grow too far away!"



ARMISTICE DAY

"WELL," said the boy named Billy, "I can call it a day! Everything is in apple-pie order, as Uncle Ned says, for Armistice Day. We Scouts are going to take part in the exercises."

"It would be interesting to be at the exercises in Arlington," said Somebody. "They are sure to be impressive."

"Arlington, Virginia, where the Unknown Soldier is buried?"

"Yes. The Unknown Soldier, as you know, represents the unidentified dead of the World War—just the ordinary, everyday, young soldier who did his duty, day after day, and was killed in the thick of battle. It was in 1921 that November eleventh was designated as a public holiday out of respect to the Unknown Soldier, and because his identity is unknown, many whose boys were never located think it may be their boy who has been thus honored in the beautiful mausoleum at Arlington."

"They all deserve the honor, anyway," said Billy. "Arlington is right near Washington, isn't it?"

"Yes, just across the historic Potomac River. The estate was formerly the home of Robert E. Lee. Part of it was used by the Union army as headquarters during the Civil War. The place is now the national cemetery for soldiers and sailors. General Sherman and General Sheridan are among the famous men whose graves are there."

"I hope we'll go there sometime," said Billy. "The first Armistice Day was in 1918, wasn't it?"

"Yes. You were too young to remember much, if anything, about it. It was preceded, three days earlier, by a false announcement, so in some sections the edge was taken off the real event by the wild joy of the premature

celebration. But, the people in some places went wild both days. You see, Marshal Foch, who represented the United States and the Allied Powers, on November eighth received on his special train near Compiegne, France, the representatives of the German government. He gave them the conditions for an armistice that had been formulated by the Supreme War Council at Versailles, the terms to be accepted, or rejected, within seventy-two hours. Someone jumped to the conclusion that they had been accepted before they actually were. They were not accepted until five o'clock in the morning, Paris time, November eleventh, signed by Marshal Foch and Vice-Admiral Sir Rosslyn Wemyss, for the Allies, and by four of Germany's five representatives."

Billy listened intently, trying to remember every word.

"Three armistices had led up to the main one," continued Somebody, "that of September twenty-ninth at Salonica between the Allies and Bulgaria; that of October thirty-first between the Turkish forces and the Allies; and that of November third, when Austria-Hungary surrendered to General Diaz, the Italian commander. On October sixth, Germany asked President Wilson for an immediate armistice on the terms he had already mentioned publicly. Notes were exchanged, and on November fifth the United States notified the German government that terms for such an agreement were to be obtained from Marshal Foch."

"But armistice means just a truce, doesn't it?" asked Billy, "not an out-and-out peace?"

"Yes. The armistice was originally for thirty days, with the option of extending it. On December twelfth, 1918, it was extended to January seventeenth, 1919, and before that time arrived, it was again extended to February seventeenth, subject to certain conditions. On February sixteenth it was extended indefinitely, with certain provisos. Final peace papers were signed in 1921."

"Well, peace is here," said Billy. "Let's hope it continues!"

THE RED CROSS

"IT seems to me you look mighty cheerful for such a hot day," said Billy's father one afternoon. "What have you been up to, Son?"

"Well, the way I figure it, Dad, July has a right to be hot," replied Billy with a grin. "Besides, our Junior Red Cross has been growing vegetables to raise some funds, and I've been working in the garden. I feel as though I'd been doing my duty."

"Glad to hear you're standing back of the big league organization, Billy, because you youngsters will have to step into our shoes sometime. Wouldn't Jean Henri Dunant feel proud, though, if he were alive, to know how his idea has taken root and grown?"

"He was the founder of the Red Cross, in a way, wasn't he?"

"Yes. Perhaps Somebody will tell you about it. I have to keep an appointment."

So Somebody and the boy named Billy proceeded to enjoy the lemonade which Big Sister had just brought out on the cool side-porch.

"All right, here goes!" said Somebody. "As they have probably told you in your auxiliary—only maybe you've forgotten it—Mr. Dunant was greatly distressed while watching the battle of Solferino in 1859, between the Italians and French on the one side, and the Austrians on the other, to see that the opponents disregarded the safety of each other's ambulances. The Austrians lost the battle, and in retreating left many of their wounded on the field.

"Mr. Dunant took it upon himself to have them removed

to a neighboring town, and he got together some volunteer nurses to care for the wounded, making no distinction between Italians and Austrians. 'All are brothers,' he said. Being Swiss, he could be neutral. Out of his own pocket he paid for medicines, surgical dressings and fruit for them, and they called him 'The Good Samaritan of Solferino.'

"Dunant insisted," went on Somebody, "what everyone now realizes, that every army should have a permanent ambulance corps, with the right of freedom from attack on the battlefield, and an emblem to distinguish it which should command respect. He wrote a book on the subject which was translated into several languages, and visited the courts of Europe to interest the heads of governments in his idea. His native city of Geneva encouraged him, and appointed a commission which brought about the first international conference on the subject, in 1863. In 1864 fourteen governments were represented and the Geneva Convention was drawn up. By 1909 all but two civilized countries had ratified this. Dunant himself visited Japan, and induced its government to join. The red cross on a white background was the symbol agreed upon. Turkey, however, uses its own sacred symbol, the crescent, instead of the cross."

"Clara Barton had a great deal to do with the beginning of it, didn't she?" asked Billy.

"Yes, she was the first American president of The Red Cross Society, and it was she who suggested its activities in time of peace. In the great floods of 1927, and the disasters of 1928 wonderful work was done by the Red Cross, which always gives valuable aid after great national calamities."

"Makes me glad I belong to that," said Billy, "as well as to the Scouts. But then, we all belong to something. Jack's sister is a Campfire Girl, Pete's sister belongs to the Girl Scouts—no slackers around this crowd!"

ABOUT THE PSALMS

"I'VE been hearing Little Sister say the Twenty-third Psalm," reported Billy, joining Somebody in the sun-parlor. "It's part of her Sunday School lesson. She's letter-perfect now."

"Evidently you're letter-perfect in it yourself, then," said Somebody.

"Oh, of course. Everybody knows the twenty-third Psalm. It's too good a thing not to know. Would you like to have me read it for you?"

"Indeed I would," said Somebody.

In a clear, serious voice Billy recited:

"The Lord is my shepherd, I shall not want.
He maketh me to lie down in green pastures: he leadeth me beside the still waters.
He restoreth my soul: he leadeth me in the paths of righteousness for his name's sake.
Yea, though I walk through the valley of the shadow of death, I will fear no evil: for thou art with me; thy rod and thy staff they comfort me.
Thou preparest a table before me in the presence of mine enemies: thou anointest my head with oil; my cup runneth over.
Surely goodness and mercy shall follow me all the days of my life; and I will dwell in the house of the Lord for ever."

"You know that it is thought the twenty-third Psalm was written by David in remembrance of his early life among the sheep folds. Since you like it so much, I'll have to get you a little book called 'The Song of Our Syrian Guest.' It explains the meaning of the Shepherd Psalm according to actual shepherd life in the place where it was composed. After you have read it you will understand this Psalm as you have never done before."

"Thank you ever so much. I'd like to have it. David wrote all the Psalms, didn't he?"

"David doubtless wrote some of them, but the authorship of the Psalms is a matter of dispute. Much study has been done over a long long period of time. Now most authorities consider that David could not have written them all, because there is strong evidence to show that the Psalms

were written over a period of several centuries. He probably did write the twenty-third Psalm, among others.

"David was a musician and a shepherd, as well as a devout man; but the words 'A Psalm of David' may have meant only 'A Psalm in the style of David.' The Sons of Korah, to whom some of the Psalms are dedicated, were a guild of temple singers.

"The compilation of one hundred and fifty Psalms, which we have, was made about 150 B. C. from earlier collections, of which there were at least ten. It contains songs of adoration, prayer, praise, prophecy, teaching, and historical events. Psalms one hundred and twenty to one hundred and thirty-four have been called Songs of Ascent. These songs were for those making a pilgrimage to Jerusalem to attend the great ceremonies. They were sung as the pilgrims journeyed onward."

"What a picture they must have made! Can't you just see them singing along and swinging along?" said Billy.

"If you have not read it," said Somebody, "read the one hundred and nineteenth Psalm."

"Thanks, I will. My friend Jack's folks are Christian Scientists, and they like to read the ninety-first Psalm."

"Something can be found in the Book of Psalms for everyone," exclaimed Somebody. "Shall we say, in the words of the last Psalm of all, 'Let everything that hath breath praise the Lord!'"

SOMETHING ABOUT SPIDERS

"OH!" said the boy named Billy. "I just got the lecturing of my life from Uncle Ned."

"What did you do to cause it?" asked Somebody.

"Killed a daddy longlegs. I thought that would make

one less spider for Mom to clean up after. Whenever she sees a cobweb she rushes for a broom. Uncle Ned says *that's* all right—by the time a web is dusty enough to be noticed it has done its work, and the spider is about through with it, anyway. It can easily make another. But he says the only things a spider catches are the insects that are injurious to man and to food-plants, and that when you kill one of our ordinary house-spiders in its web you're killing a *friend*."

"That's true."

"But spiders bite," objected Billy.

"Our ordinary spiders don't bite hard enough to kill anything but an insect," said Somebody. "The great French naturalist, Fabre, says their bite is less injurious than the bite of a gnat."

"My, I wish I'd known that before!" said Billy.

"If we knew everything to start with," Somebody consoled him, "there would be no fun in living. But I suspect it was not a daddy longlegs you killed, but his wife, as she is much larger."

"I always supposed a spider was an insect, but Uncle Ned says it's not. Is that right?"

"Your Uncle Ned generally knows what he's talking about," replied Somebody with a smile. "Spiders are arachnids, differing from insects in the number of legs and body-divisions. The spider's four pairs of legs end in little claws."

"The better to catch you with, my child," said Billy, thinking of the wolf in 'Red Riding Hood.' "Where does the sticky substance that makes the web come from?"

"From little glands in the abdomen," answered Somebody. "The spider raises the three little tubes, called spinnerets, that are at the end of its body, and, by pushing them against something, makes the web-material flow out of each. As the strands strike the air they harden and unite. The one strand resulting is then fastened to some nearby object. First it is a tiny bridge and then a series of strands, and the

net is constructed on these strands. Madame Spider's insect-catching industry is now open for business."

"Why does she never get caught in her own web?"

"She runs along the spokes of the cobweb wheel."

"In other words, she knows the ropes."

"Yes, she needs to in order to avoid the sticky drops she puts on the threads to hold her prey after she has caught it. Spiders have traveled all over the world by means of their cobweb strands. Sometimes the wind blows a spider away out into the ocean on its own thread. its little magic carpet."

"I wish I had a magic carpet," said Billy. "But there are spiders that don't spin webs, aren't there?"

"Yes, indeed. The tarantulas do not spin webs; neither do the trap-door spiders; nor the strange crab-spiders, that can walk sidewise and catch their prey with their forelegs; nor the wolf spiders, nor the jumping spiders. The trap-door spider is so called because it burrows into the ground, lines this cavity with spun-silk, and then covers the entrance, making a trap just as men make traps for jungle beasts to fall into. The water-spiders make a nest in the water that is actually water-tight, and then inflate it by means of air-bubbles which they carry down to it in the hairs on their bodies."

"Now that is a really-so story that just seems impossible," said Billy.

"Doesn't it? But nature is always doing the seemingly impossible. You can read many other interesting things in Fabre's wonderful book, 'The Life of the Spider'."

"I surely want to read that. And I want to read over again that story about Robert Bruce in the cave."

"And don't forget the story of Arachne, who was changed into a spider by Minerva because she was too proud of her spinning. Of course, it's only a myth, but there's an idea back of it."

"A pretty good idea, too," said the boy named Billy.

NAVY DAY

"PLEASE may I take that ship model that's on the mantel-piece to school for the Navy Day program?" Billy asked his mother. "Teacher says we must make a *special* effort for this celebration, which isn't so old as some of the others."

"Why, of course, Billy, you may take the model, if you'll be careful of it. There wasn't any Navy Day when I went to school. Just how old *is* Navy Day, Somebody?"

"It was first celebrated in 1922," replied Somebody. "In 1927, I attended the exercises at the Brooklyn Navy Yard, which kept 'open house' for the day. More than eight thousand people were there, most of them school children. It was an interesting experience. The Coast Guard gave demonstrations of life saving. A ship that was anchored at a distance of one hundred feet out in the river was called a wreck and fifty so-called 'survivors' were brought ashore, just to show how it is done. Sailors took people aboard several ships, including the Submarine S-51, which was being repaired."

"Oh!" exclaimed Billy. "That must have been interesting!"

"There were wonderful exercises in many other places, too," said Somebody; "manoeuvers of ships and naval aircraft, and reviews of naval militia. Though Navy Day is still young, more people are celebrating it, every year, and it is now noted in some way in all the states and territories in the Union. Inland communities, though they have no ships to visit, do all they can by means of public exercises

to stress the importance of the Navy's services in both peace and war."

"Who started Navy Day?" asked Billy.

"It was first sponsored by the Navy League of the United States, and the League continues an active interest in the celebration, which has been taken up by veterans' and patriotic societies. And of course the Navy Department does everything in its power to provide practical demonstrations of the Navy's value to the nation."

"Navy Day always comes on October 27, doesn't it?" asked Billy.

"Yes, on Theodore Roosevelt's birthday," answered Somebody. "President Roosevelt realized fully the importance of the 'first line of defense,' and the need of having good ships in fine condition."

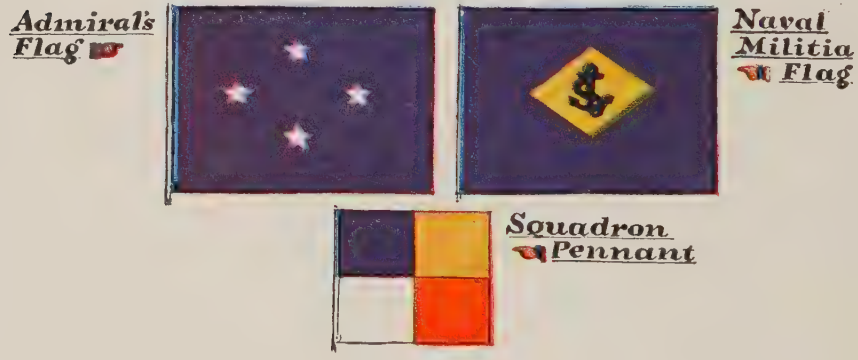
"In other words, ship-shape," said Billy. "That was a great slogan he created for the Navy: 'The only shots that count are those that hit'."

"When was it that he sent the fleet around the world?" asked Billy's mother. "I don't remember, exactly."

"In 1907. It has always been said that Great Britain protects her subjects in every quarter of the globe, and that cruise showed that the citizens of the United States have similar protection."

"When Pete is older he is going to try for Annapolis," said Billy. "I wish him luck."

"I'm sure we all do," said Somebody.



MR. HUMMING-BIRD, AMERICAN CITIZEN

"OH! Look quick! It's gone! No, there it is again," gasped Little Sister. Her water-colors were forgotten.

Somebody and the boy named Billy were just in time to see an iridescent jewel sparkling in the sunshine, poised miraculously in front of a honeysuckle cluster, then it was gone.

"Oh!" said Little Sister. "I get so excited when I see a humming-bird. I always wonder whether I've really seen it, or only imagined it."

"You do get a kick out of the queerest things," said Billy. "Now if it were a good hockey match— But I agree with you that a humming-bird is interesting."

"And the most interesting part of it is," said Somebody, "that he is a purely American product. Not only is he native to North and South America, but attempts to make him live elsewhere have not been successful."

"This was such a teeny-weeny one," said Little Sister.

"The ruby-throated humming-birds, such as we see here, are from four to six inches long, but there are smaller ones in Cuba. Without their feathers, they are no bigger than a bumblebee. The very largest, in the Andes, are only eight and a half inches long."

"I'm glad we have honeysuckle," said Little Sister, "so they come here every summer."

"I've seen them in Bob White's yard, too," said Billy, "around that trumpet-flower vine that climbs all over the tree that was struck by lightning."

"The humming-bird's long bill," said Somebody, "is adapted to the shape of the flower it generally visits. Like the bumblebee, the humming-bird, by carrying pollen, helps in the cultivation of the flowers. The sword-bill, which gathers honey from flowers having long nectar-sacs, has a bill five inches long, longer indeed than all the rest of him. Then there is another kind having a bill only a quarter of an inch long, while the bill of the sickle-billed humming-bird has a very pronounced curve."

"I never get over wondering at the things that are *really so*," said Billy. "No one could ever make up stories to beat them."

"Of course," said Somebody, "the long forked tongue helps in the food-gathering, too, and sometimes not only the honey, but little insects inside the flower are taken. Sometimes the tiny bird will invade a spider's web to get the captives there—and a disastrous fight with Mrs. Spider may be the result. But humming-birds are not afraid of

a fight. They will attack birds of prey with their needle-like bills, especially in nesting-season, when the babies must be protected."

"Oh, tell about the humming-bird babies," pleaded Little Sister.

"Well, high up among the branches, Mother Humming-bird makes the daintiest little cradle out of grass, pieces of bark and cat-tail fluff, and around the outside puts bark and lichens the same color as the tree, so the cradle will not be noticed. There are always just two plain white eggs, and oh! the care they receive until they are hatched! And the care the little ones receive!"

"And they should!" exclaimed the little girl, "because a humming-bird seems something almost too good to be true. It's like a fairy-tale come to life."

"It's like a Fairy Tale come to life"

MR. MINK, THE WEASEL

"BOB WHITE and I saw a mink down by the river yesterday," said Billy.

"I'm not surprised," replied Uncle Ned. "Minks are such saucy little creatures, you're likely to find them quite close to people's homes, if there's a good stream near. In Maine, once, I had a nice catch of fish, and was cleaning them to cook for dinner. After scaling each fish, I would reach behind me and drop it into a pan. When I got through, I turned around to pick up the pan—and was just in time to see a mink making off with my last fish. He had been picking them up as fast as I laid them down, and was burying them beside the river."

"Were you cross?" asked Billy.

"Certainly not. What's the use of being angry at a little animal that's only obeying the law of its nature? But we didn't have fish for dinner in camp that day. Oh, minks are sly! They are weasels, you know."

"You mean they belong to the weasel family?"

"Yes, *mustelidae*. That winter we spent in the log-cabin in the Minnesota lumber-camp, on account of Big Sister's health, the cook had a really, truly weasel for a pet.

"Every noon we used to watch the cook's little weasel come to the back door of the cook-house for its dinner. Oh, but I forgot! This really-so story is a tragedy!"

"How is that?" asked Billy.

"Well, the weasel turns white in the winter, you know, to match the snow. One day a stranger, who didn't know the weasel was a pet, shot it for its fur. I've never seen any man, before, nor since, as angry as the cook was. That stranger had to make himself mighty scarce around there.

"I should hope so," said the boy named Billy.

ABOUT APPLES

THE boy named Billy flicked his apple-core deftly into the center of the glowing embers of Somebody's grate-fire. There was just enough coolness in the autumn air to make an excuse for a fire, and as Billy said, "It surely is chummy."

"What is better than an apple?" asked the boy.

"Nothing that I know of," replied Somebody, "unless it's another apple."

"Thanks for the hint. I'll take another," said Billy, choosing a particularly red-cheeked one from the dish on the table. "Isn't it funny! Mom likes crab-apples best of all. Wonder how many names of apples I know! Let's see! There's Red Astrachan—they were ripe before we came away from great-uncle David's last summer—Bellflower, Duchess, Winesap, Ben Davis and Russet—oh! boy! are they good?—and of course those big Western apples—"

"Some people, your Uncle Ned, for instance, will eat only the Eastern apples of the cold north country, claiming that struggle develops flavor in apples just as it develops character in people. But the Western apples are delicious, too, and the Western apple-growers have done a great deal for the industry, helping to standardize the grade of fruit sold, and advertising the apple."

"Nobody needs to advertise it to me," replied Billy. "As Uncle Ned would say, I'm sold on it already."

"Apples are the best-known and best-liked fruit in the world. Authorities differ about the early history of apples in this country, but at any rate, they have thriven here, and America has become the greatest apple-raising and exporting region."

"There have been lots of stories about apples, haven't there, Somebody?"

"Yes. Stories—both really-so and make-believe—have been associated with apples from the beginning of man's history on this globe."

"I remember especially the one about William Tell shooting the apple off his son's head," said Billy; "all about the tyrant Gessler and the Swiss cantons that wouldn't surrender. That's one of the best stories anybody ever heard."

"Yes, and then there's the one about the Apple of

Discord, which caused the Trojan war. It had the words, 'For the fairest,' on it, and the three most beautiful goddesses, Juno, Venus and Minerva, all claimed it. And because Paris, who came from Troy, awarded it to Venus, Juno decided to destroy the whole Trojan race."

"How foolish!" exclaimed Billy. "The other day the teacher was telling us about Johnny Appleseed."

"I'm glad she did. He's worth knowing about. He scattered apple-seeds through Ohio and Pennsylvania and when the trees were growing took care of them."

"What Uncle Bob would call follow-up work," said Billy.

"Yes, and very practical follow-up work, too," said Somebody. "One of the most interesting things about apples

is that, in their case, the old statement that like comes from like is not entirely true, for a tree grown from the seed of a Jonathan, for instance, may not be a Jonathan at all."

"Then how do they get Jonathans when they want them?" asked Billy.

"By grafting a Jonathan bud on some other apple-seedling. The tree resulting from this combination is the same variety as the bud, or shoot, grafted on. Both Luther Burbank and John F. Spencer of Colorado developed so-called seedless apples, in which the horny substance coating the seeds is absent. The codling worm does not attack this variety of apple."

"So the codling worm likes just the core," commented Billy. "Great-uncle David and Sam, the hired man, were spraying with Bordeaux mixture, I remember."

"That was probably for rust. Spraying doesn't help for the borers,—the lower part of the trees must be painted with whitewash, or fish-oil soap, in June and July, to prevent the eggs from being laid on the bark."

"Gives a farmer plenty to think about, doesn't it?" said Billy. "I'll appreciate my apples even more, after this."

SHAKESPEARE'S BIRTHDAY

"'TO be, or not to be, that is the question'," declaimed Billy.

"My goodness! Why all the spouting?" asked Little Sister.

"Because tomorrow is April 23, Shakespeare's birthday, and in the afternoon we're going to have a special program.

I am to recite Hamlet's soliloquy—that means a speech when he was all alone, youngster."

"I s'pose you'll go and forget it," said Little Sister.

"I suppose I *won't*. Bob White is going to do 'All the world's a stage,' and Jack has 'The quality of mercy is not strained.' Then Miss Peters, the new music teacher, is going to sing some of those fluttery songs about bees and fairies. There'll be sad and dramatic pieces and funny dialogues—and *all* Shakespeare."

"Oh, well," said Somebody, "Shakespeare represents a world in himself. He is the greatest literary genius of all time, and he had deep understanding of people and why they do things."

"His work has certainly stood the test of time," said Billy's father, who had just come in. "A friend of mine works for a big motion picture company that filmed one of Shakespeare's plays. Before it was ready for the public, some of the picture was run off in the company's projection room, and one of the familiar quotations was flashed. A foreigner who did not know Shakespeare in the original, but had studied it in a translation, exclaimed, 'that boy certainly could write'!"

Billy laughed. "Anyway, it proves that Shakespeare still *gets over*, doesn't it, Dad?"

"That's what I hoped you'd see, son. There will be celebrations by the Shakespeare societies all over the world tomorrow. In New York, at the Players' Club, which was founded by Edwin Booth, Shakespeare's birthday is celebrated as Ladies' Day, the only day in the year when ladies may visit the club and view the historic pictures and playbills."

"Well, every day is ladies' day at school, and I hope Mom will come tomorrow. Will you, Mom?"

"I wouldn't miss it for the world," said Billy's mother, "and if you do your recitation well, we'll all go to the revival of 'The Merchant of Venice'."

A FRIEND OF MINE WORKS FOR A BIG MOTION PICTURE COMPANY

SOMETHING ABOUT WOOL

THE boy named Billy finished his home-work and closed his books. His glance wandered to the old spinning-wheel in the corner.

"Well!" he exclaimed. "That old spinning-wheel has always been there, but I don't believe I ever really *noticed* it before."

"Big Sister likes to have it where she can see it from

the piano," explained his mother. "She says it inspires her."

"If that's what made you play that ripply piece a while ago, Sis," said Billy, "let's keep the spinning-wheel ornament right where it is."

"That was the 'Moonlight Sonata'," said Big Sister. "But the old spinning-wheel was much more than an ornament; wasn't it, mother?"

"Indeed, yes! On that very spinning-wheel your great-great-grandmother Jane spun into yarn all the wool used for the family's clothing, then wove it into cloth and made the garments. She made everything your great-great-grandfather David wore except his shoes—even his hats and overcoats."

"What a wonderful person!" said Billy.

"You may well say so. Now, of course, all that work, even the shearing of the sheep whose coats provide us with the wool, is done by machinery. Perhaps Somebody will tell you more about it."

"How much fleece do they get from one sheep, do you suppose?" asked Billy.

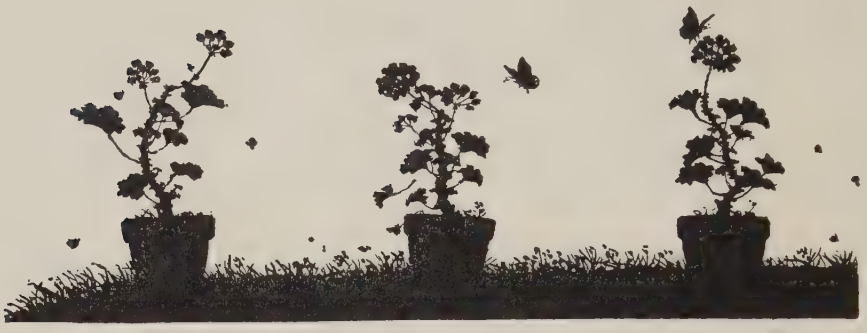
"It varies," replied Somebody; "generally from five to eight pounds, though it may run either more or less. After it has been sheared, either by hand or machinery, it has to be graded, very thoroughly cleansed, dusted and dried. Carding takes out the tangles, then the condensing machine brings it out in light strands ready for spinning into yarn; next it goes to the weaving-room, where it is made into cloth by arranging it in two sets of inter-woven threads, the warp and the filling."

"The warp is lengthwise, isn't it?" asked Billy.

"Yes, and the filling, or weft, is crosswise. Cotton is sometimes combined with wool, but the best fabric contains nothing but the wool, and the expression, 'All wool and a yard wide,' has become a synonym for genuineness."

"In other words," said Billy, "we like wool to be really-so."

DECORATION DAY



"IF TODAY had been made to order," said Billy, "it couldn't have been better. Sis, you guard the wreaths and flowers while I go and tie up old dog Towse. He's just bound 'n' *determined* to come with us. The folks will be out in a minute."

Soon they were on the way. There were cars ahead of them and cars behind them. Everyone, it seemed, was going to the cemetery to decorate the graves of the heroic dead.

"I like to remember," said Billy's mother, "that the country owes the idea of Decoration Day to the women of the South. It was they who, after the close of the Civil War, strewed wild flowers over the graves of their soldiers who were killed in battle. Then General John A. Logan, Commander-in-chief of the Grand Army of the Republic, chose May 30 as the day for the *Union* soldiers to receive the same honor. The North has always kept that date, but in the South, Memorial Day is celebrated earlier."

"Is that because the flowers blossom earlier there?" asked Little Sister.

"That may have something to do with it, but in some of

the Southern states, June 3, the birthday of Jefferson Davis is celebrated as Confederate Memorial Day."

"The exact date doesn't matter so much, does it?" asked Billy. "Just so that no one is forgotten. How's everything there on the back seat, Sis? Is the wreath for grandfather's grave all right?"

"Yes," answered Little Sister, "and I'm trying not to let this shrub we're going to plant on Uncle Walter's get joggled too much. What are these words on his wreath?"

" 'Remember the Maine,' " read Billy. "What does that mean, Mom?"

"The sinking of the battleship Maine was a cause of the Spanish-American war, in which your uncle Walter served. I don't believe in clinging to old grudges, but our florist, who was a friend of his, added that streamer himself. I know he meant well, so I let it stay."

"I see. Here we are! Let me take the heavy basket! Sis, you take the other one."

And the boy named Billy, fully appreciating the meaning and importance of Memorial Day, looked very serious as the little group entered the sacred grounds.

ABOUT NAMES

BILLY was looking intently at his name on a letter that had come from Aunt Bertha by air-mail, just as if he had never seen it before.

"Names are funny things," he said.

"Foreign names sometimes *seem* funny," said Somebody, "and so people sometimes have their names changed by law. Or the name may be a hard one for another nationality to pronounce."

"Like some of those Polish or Russian jaw-breakers," said Billy.

"Yes, but our names may be just as jaw-breaking to them."

"How did people *get* their names, anyway? Of course I know I got my surname from Dad, but when did it all begin?"

"Names have not always been hereditary," replied Somebody. "They were not hereditary in England before the eleventh century. Your father's name was probably taken from that of the ancestor who lived when names first began to be handed down from father to children."

"I suppose some of them came from occupations," said Billy, "like Smith, Cook, Fisher and Taylor."

"Good guess! Clark, which is the English pronunciation of the word 'clerk,' is another. Now pick up the telephone directory and open it at random. What name do you find?"

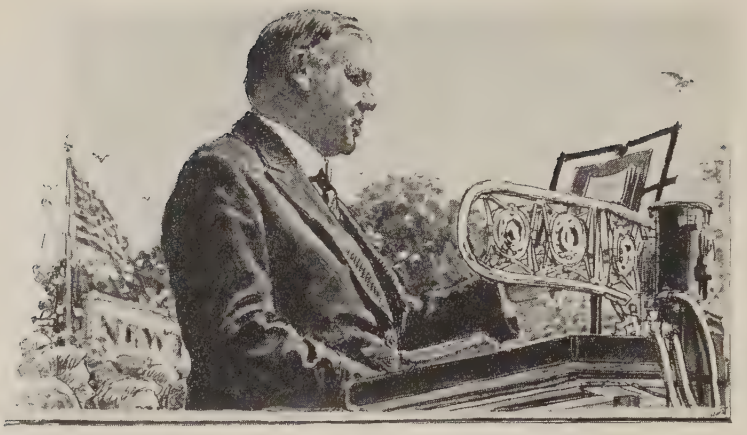
"Greenfield."

"That illustrates another way people were named, from the places where they lived, or came from. It accounts for names like Townsend, Ireland, and those beginning with De, O' and At, such as De Quincey, O'Hara and Atwater."

"Then there are a lot of names ending in 'son'," said Billy.

"Yes, those are obvious, but many people do not know that the final s of some names is a shortening of 'son', as for instance in Williams and Jones. Some peculiarity of the person was often the source of his name, like White, Gray, Short, Brown or Strong. Howard F. Baker, author of 'American Speech,' has pointed out that the ten surnames most numerous in this country are Smith, Johnson, Brown, Williams, Jones, Miller, Davis, Anderson, Wilson and Moore. From what we have already said, you can figure out the origin of every one of them. Now, of course, names no longer describe their owners,—they only identify them."

"Well, that's *some* help," said the boy named Billy.



RADIO

GRANDMOTHER, who was on a visit to the family, put down the radio section of the evening paper. "Oh, dear!" she exclaimed. "I never will get used to all these new words—heterodyne, kilocycle, calibrated, cone-speaker. I understand about as much of it as I would the language of Mars."

"It sounds quite reasonable to me, Grandmother," said Billy, a little puzzled, for everyone always referred to his grandmother as a brilliant woman. "Why, you talk over the radio yourself for your current events club."

"Using a microphone isn't understanding it," insisted Grandmother. "I confess it's still new to me."

"Billy," said Somebody, "you should remember that you and radio and old dog Towse all grew up together, so of course it seems as natural to you as breathing. However, I doubt whether anyone really *understands* it. For instance, Edison would like to know what electricity is. By the time you're old enough to be President, there will be new things to learn that will keep you on the jump."

"There are now," said Billy.

"And radio is providing us with new ones every day. Scientists and inventors are making such rapid progress

that it is going to keep the law-makers sitting up nights to make rules and regulations that are fair to everybody."

"Doesn't surprise me a bit," said Grandmother. "A healthy child always outgrows its clothes faster than you can get new ones for him."

"Who invented radio, anyway?" Billy asked.

"Many people have helped, each adding something for others to build upon," answered Somebody. "This is a co-operative world; we all have to do our bit. But the man who might be called the father of wireless telegraphy was James Clerk Maxwell, a Scotchman, one of the greatest thinkers of the nineteenth century. He formed the theory that electricity and light are of the same nature, and he showed that electro-magnetic action moves in the form of transverse waves like those of light and that they move at the same speed.

"Heinrich Hertz actually produced these waves and measured their velocity. He also showed how they could be detected, but a man named Branly found a better way of detecting them, by using metal filings which cohered when brought in contact with an electric spark. Do you follow me?"

"I follow you," said Billy.

"I follow you," said Grandmother, "but at some distance behind."

"I'm afraid you're too modest," replied Somebody. "This coherer was improved by Marconi, who was the first to use antenna. It was Sir Oliver Lodge who invented the inductive coupling of circuits, but Marconi also made achievements along this line, by different means. He succeeded first in telegraphing a short distance 'via wireless,' and later in telegraphing in this way across the Atlantic Ocean.

"The discoveries of such men as Alexanderson, Fessenden and Lee De Forest led up to radio telephoning. The development of the continuous wave was an important factor. The Bell Telephone System's active interest resulted in transoceanic radio telephoning in 1915. Ships at sea were the first to benefit by this. Our country was the first to provide practical radio fog signals for their guidance, and it leads all the European countries, combined, in the number of them. Wonderful progress in this respect has also been made by Canada.

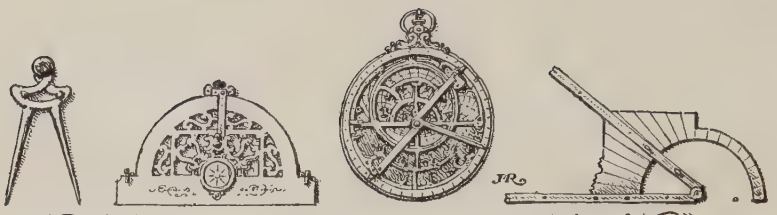
"It was in 1922," went on Somebody, "that wire lines were first used as an aid to broadcasting, the first big event so handled being the Chicago-Princeton football game. The address of Vice-President Dawes at the Radio Industries banquet in 1926 went all over the United States by means of thirty-eight broadcasting stations. And as to the big event of 1927—I give you three guesses, Billy."

"I need only one. *Lindbergh!*"

"Right! WEAF placed announcers at different points along the line of march, for the receptions in both Washington and New York, so that all over the country people could hear the joyous shouts of the crowd, the speeches, and even the aircraft humming overhead."

"I'll say we could," said Billy. "That was a day to remember."

LINDBERGH !



Mariner's Instruments used in Columbus' Time

COLUMBUS DAY

"HOORAY! Columbus Day!" said Billy. "First holiday this semester. We've had school only a little over a month, but it seems a lot longer. When did we start observing Columbus Day, Somebody? Seems to me we've always had it, and yet Dad says it began not so very long ago."

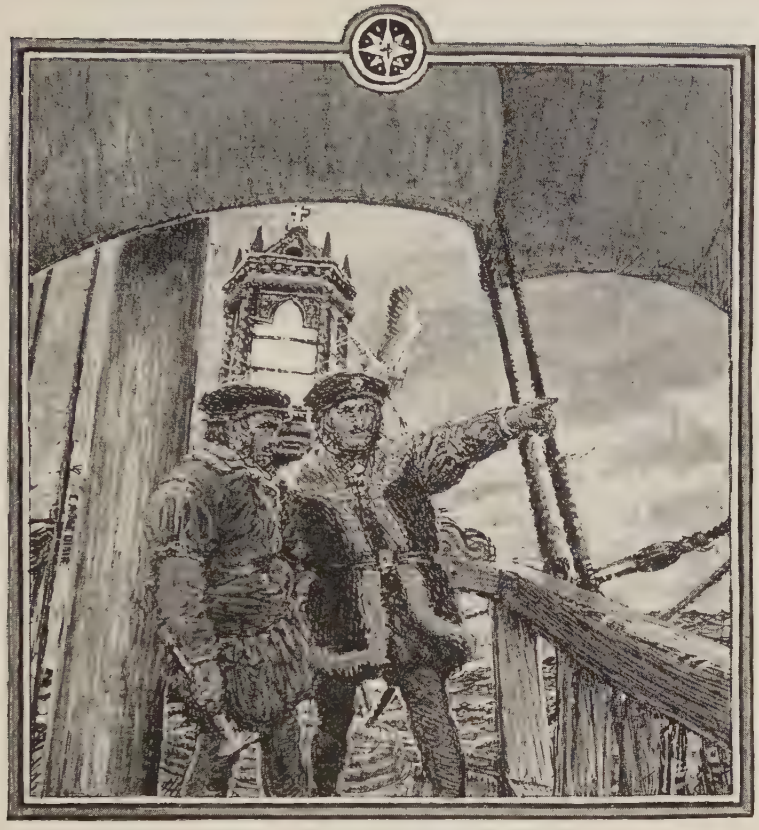
"You're both right," said Somebody. "We've observed it as long as you can remember, and yet your father can remember a time when it was not generally observed. In 1892, we celebrated the four hundredth anniversary of the landing of Columbus in the New World, but Colorado was the first state to make a regular observance of Columbus Day. By 1918, thirty-three other states had fallen into line. The schools, of course, took it up, as they are always public-spirited about those things."

"Well, there was some sense to a man like Columbus," said Billy. "He's one of my favorites—got an idea in his head and just stuck to it."

"Yes! Evidently he had the same mottoes you Scouts have: 'Be prepared' and 'Keep on keeping on,' for he certainly lived up to them. There has never been a better example of perseverance. Here comes the postman. See what he has."

"It's a post-card for me," Billy reported, "from Uncle Bob on his New York trip. It has a picture of the statue of Columbus at Columbus Circle, and Uncle Bob has written, 'Every day is Columbus Day here'."

"Every day is Columbus Day anywhere in America," replied Somebody, "but this is the day when we remember it."



COLUMBUS KEPT ON!

Flag of Castile & Leon

MAHOGANY, AN AMERICAN PRODUCT

WARM and dusty but triumphant, Billy's father came through the living-room into the sun-parlor. "I knew it!" he exclaimed. "It *was* mahogany! I've been out on the back porch scraping that old 'sofa' I bought at the second-hand store the other day. Some ignoramus had painted it blue! Imagine! Mahogany! Well, now I'll go and get cleaned up for dinner."

"He can always recognize mahogany, no matter how it's disguised," Billy's mother explained to Somebody. "All the furniture in his boyhood home was mahogany."

"But why was Dad so excited about it?" Billy asked Somebody, when his mother had gone to put the finishing touches on the table. "Is mahogany so valuable?"

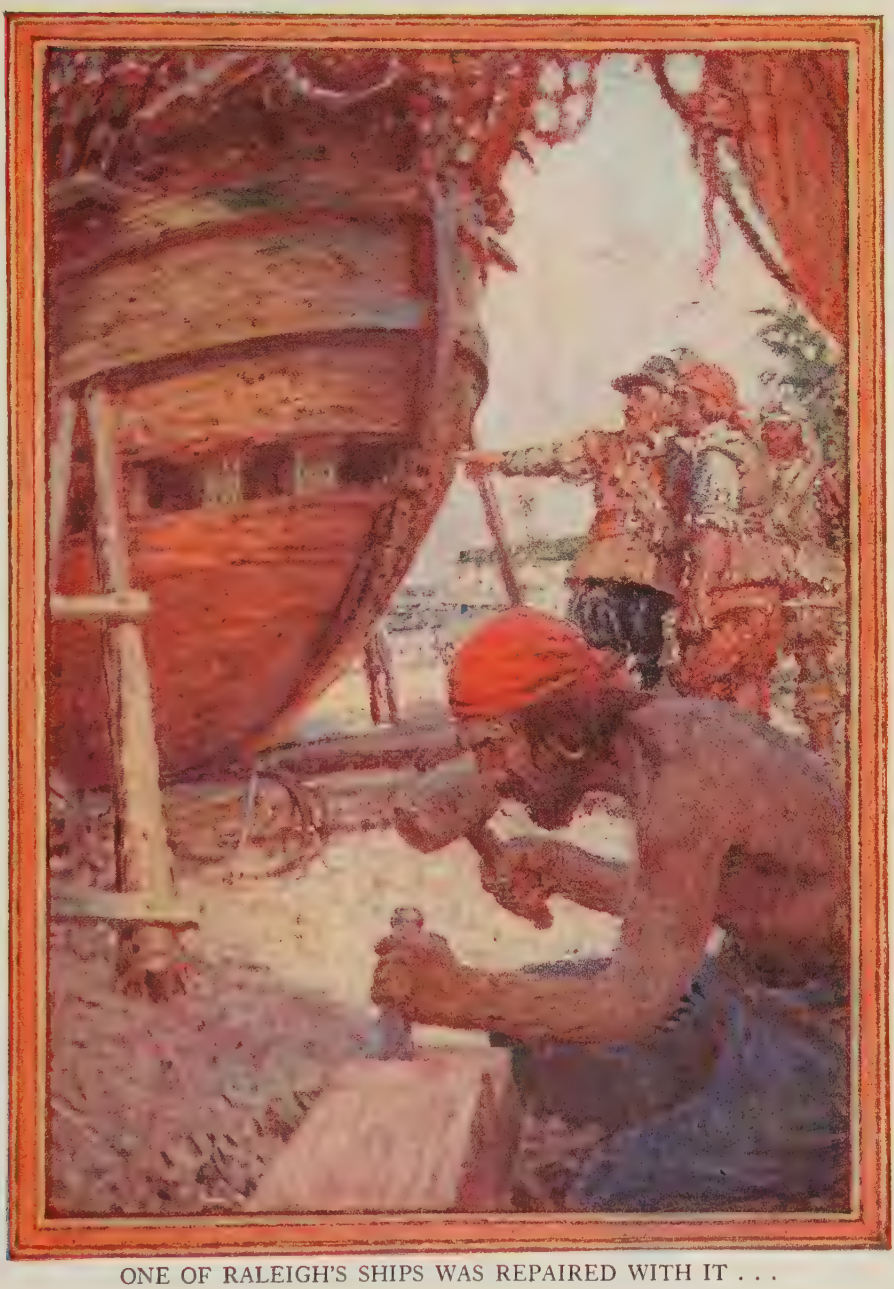
"Well, it *is* a very finely grained and well marked wood. The tree takes a hundred years to reach perfection, and grows from sixty to a hundred feet high. It is distinctly an American product. It grows in our tropical regions. The best mahogany comes from Santo Domingo, being called Spanish mahogany, and from Cuba.

"Sir Walter Raleigh introduced it into England. One of his ships was repaired with it on the Spanish Main. The English colonists thought so much of their mahogany four-poster beds, 'highboys,' and other articles of furniture that they brought them over here with them—back to the part of the world where the wood had originally come from. And mahogany has always been associated in people's minds with dignity and excellence."

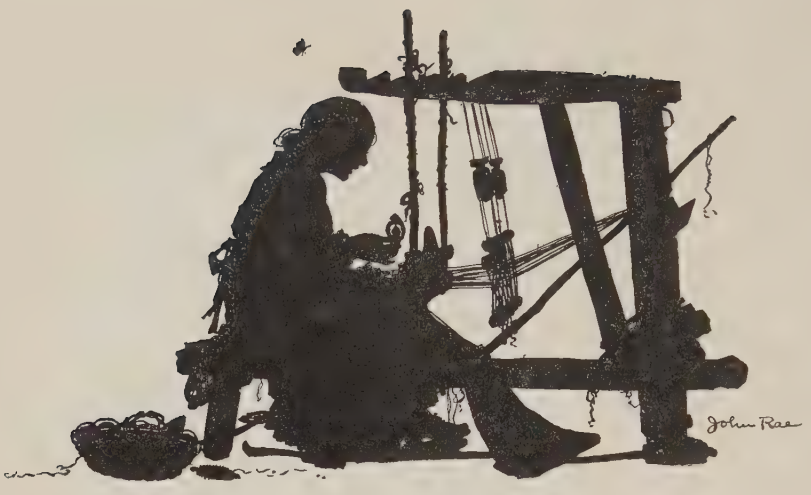
"Then no wonder Dad was glad to get hold of a piece of it."

"Not only that," said Somebody, "but he rescued something good that had not been appreciated."

"Well, that's worth doing, isn't it?" said the boy named Billy.



ONE OF RALEIGH'S SHIPS WAS REPAIRED WITH IT . . .



An Old-Time Linen Loom

ABOUT LINEN

"THERE!" said Billy's mother as she finished embroidering some handkerchiefs for Big Sister's birthday. "That's done, and every thread pure linen."

"I was just reading about linen in my Sunday School lesson," said Billy: " 'A certain rich man clothed in purple and fine linen.' Mom, why is linen so much prized?"

"Perhaps Somebody will tell you," replied his mother. "I must put these handkerchiefs away so that Big Sister won't see them too soon."

"One of the reasons," said Somebody, "is that the greatest care has always entered into the making of it. Until quite recent times the spinning and weaving were all done by hand. Even after machinery was invented for cotton, this had to be modified for linen, because flax yarn was not so elastic as cotton."

"That's right!" exclaimed Billy. "I *did* know that linen is supposed to come from flax."

"Yes, it is supposed to come from flax, but sometimes it is made of hemp, which gives a coarser grade, and sometimes it is combined with cotton. A good judge of linen

looks for fineness, density and evenness. To give the density, the thread is rolled instead of being used flat. The best Irish and Scotch linens are bleached on the grass in the sun, as chemical bleaching is said to destroy the gum binding the fibres."

"That sounds reasonable," said Billy. "Irish linen is the best, isn't it?"

"Well, French linen is very fragile and expensive, and Scotch linen is useful for medium grade articles, but Ireland's moist climate is ideal for the growing of flax, and Irish linen is considered the whitest and best. Mr. Mead, the Episcopal minister, has the white part of his surplices made of ecclesiastical linen, from flax grown in Ireland especially for the vestments of the clergy. For this purpose, the plant itself is dedicated to the church even while it is growing."

"That's a great idea," said Billy, "when you come to think about it."

"Linen was used for priestly garments," continued Somebody, "even before Aaron and his sons were chosen as ministers. The priests of Egypt were called 'the linen-wearing,' and linen made five thousand years ago has been found in Egyptian tombs, some of it covered with hieroglyphics, since it was used to write on. The making of linen gradually spread throughout the world, but since the introduction of machinery it is possible to have more good linen with fewer people having to work so hard."

"Well, I'm glad of *that*," said the boy named Billy.

The first Photographic Portrait ever made!

PHOTOGRAPHS, MOVING AND TALKING

"DAD," asked the boy named Billy, "are you sure our little movie camera has film in it? You said you were going to take pictures of the graduation exercises."

"The camera has been filled," replied his father reassuringly.

"I always thought my kodak was wonderful enough," said Billy, "but the movie camera is even more so. Who invented photographs, anyway, and who made them move?"

His father laughed. "Questions just as we're starting out? You'd better ask Somebody. I should have to go and look it up."

"As a matter of fact," Somebody said, "the photographs do not move. Many snapshots are taken rapidly, one after another, on a roll of film, and then also shown very rapidly—so fast, indeed, that the eye does not register the short periods of darkness between them."

"Oh, I know," exclaimed Billy. "It's like that toy book Little Sister had. When she fluttered the pages through with her thumb the figures seemed to be doing a folk-dance, though there were just several pictures drawn in different positions."

"Yes, and our present motion pictures have been developed from a toy, as the aeroplane was. But photography had to be invented first. A Swedish chemist named Scheele discovered the action of light on silver compounds; two

Englishmen, Wedgwood and Davy, made prints of ferns by putting them on paper treated with silver chloride and letting the sun shine on them; two Frenchmen, Niepce and Daguerre, used a camera and found out how to keep the prints from fading; and an American, Professor John Draper, made the first photograph of a person. So you see it's an international affair. Originally, a time-exposure of seven hours was necessary to get a picture of a scene, and three hours to photograph one object such as a statue."

"And now," said Billy, "they take movies from aeroplanes! Remember when we saw the pictures of the Graf Zeppelin finishing its flight from Germany to America, in 1928?"

"Yes, and you can always remember that you saw the first all-talking movie, 'The Lights of New York,' in the same year."

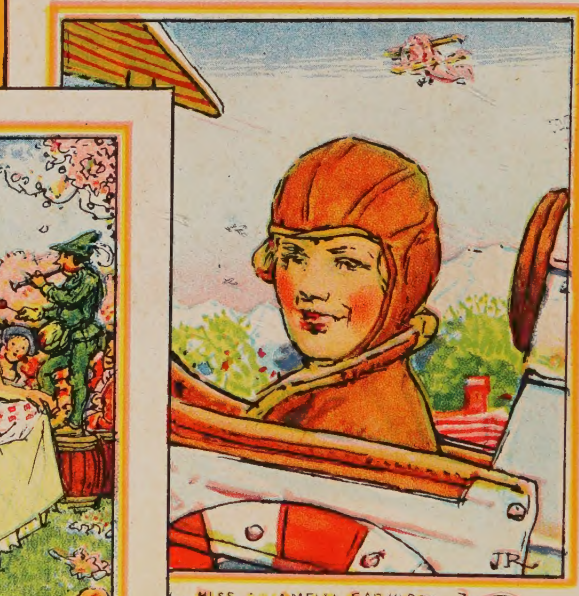
"How do they make the sound and the picture come together so much better than they used to?"

"That's a fascinating process! The sounds are recorded on the edge of the negative film which also records the pictures. But who knows what wonderful thing will be invented tomorrow?"

"Thank you very much, Somebody," said the boy named Billy. "I certainly enjoy your Really-So stories. Well, are we all ready?"

Taking Moving Picture from Survey Plane

What next? ? ?



MISS AMELIA EARHART

"KEARSAGE" and the

JR

Rainbow Edition